The PHOTOFACT® Servicer

SET 468 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ DEC., 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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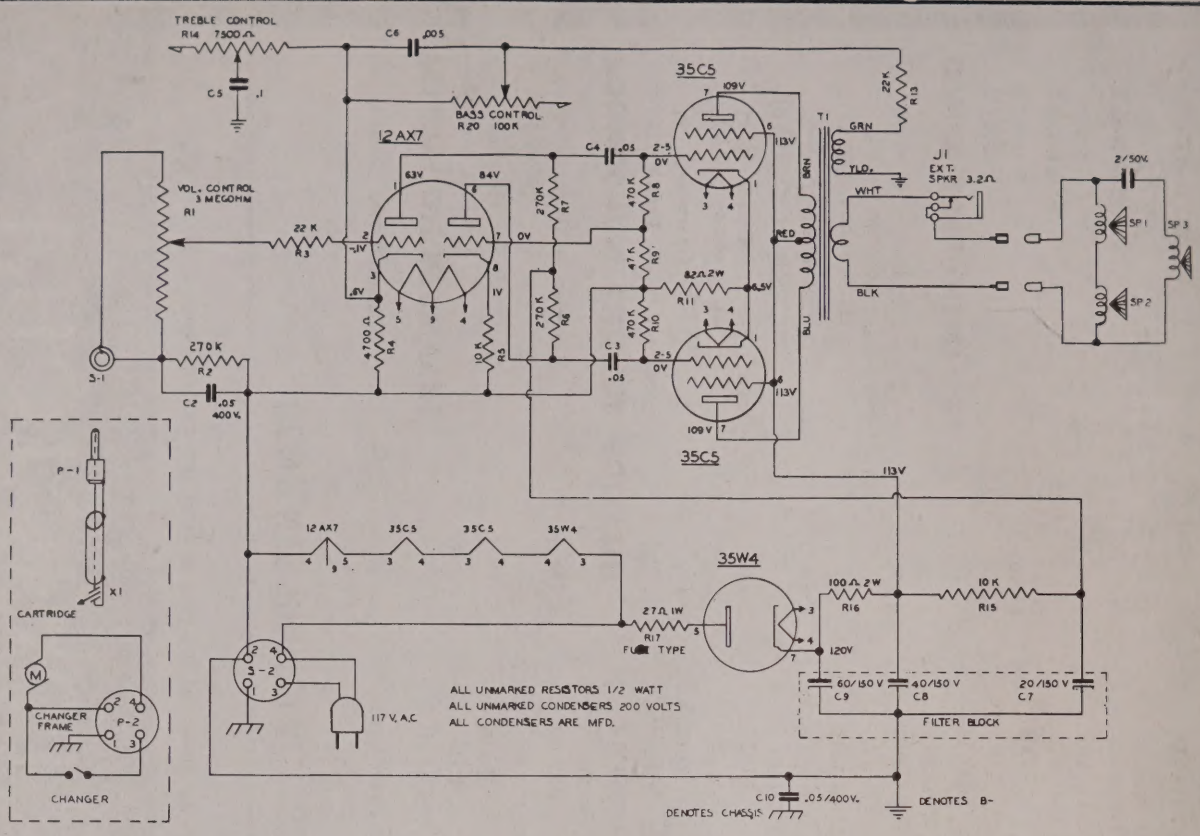
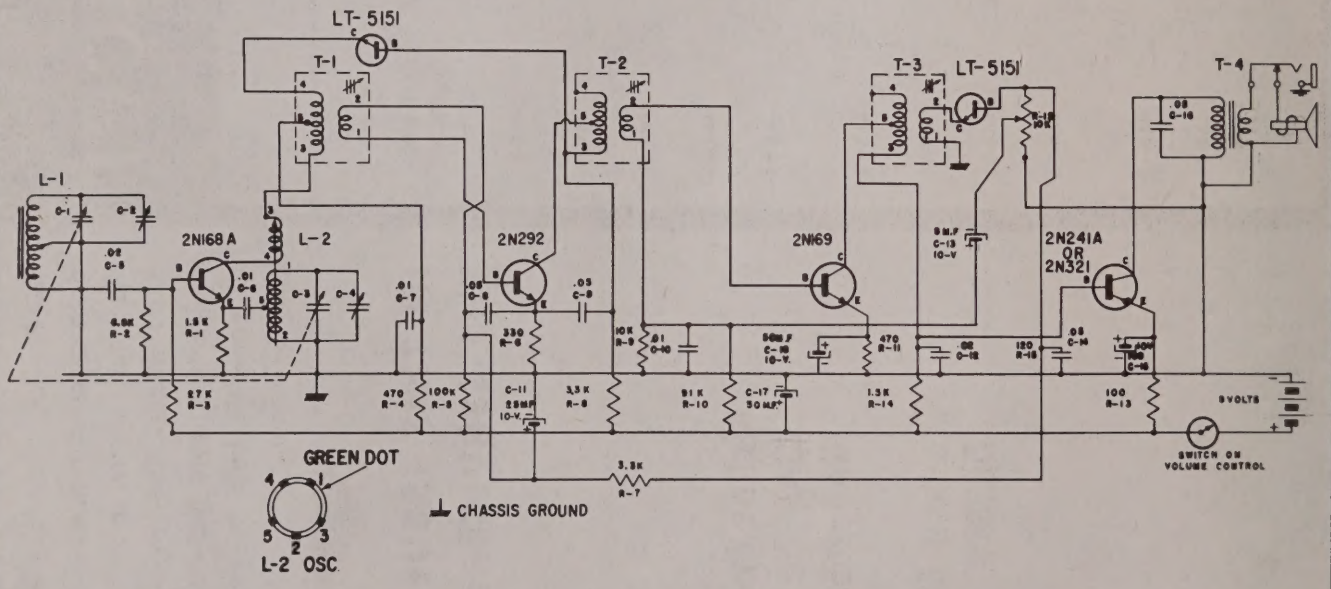
GAA-2655A,
GAA-2656A

Truetone Model
DC3884C



AIRLINE MODELS GAA-2655A, GAA-2656A

Schematic Diagram Courtesy of Montgomery Ward & Company



TRUETONE MODEL DC3884C

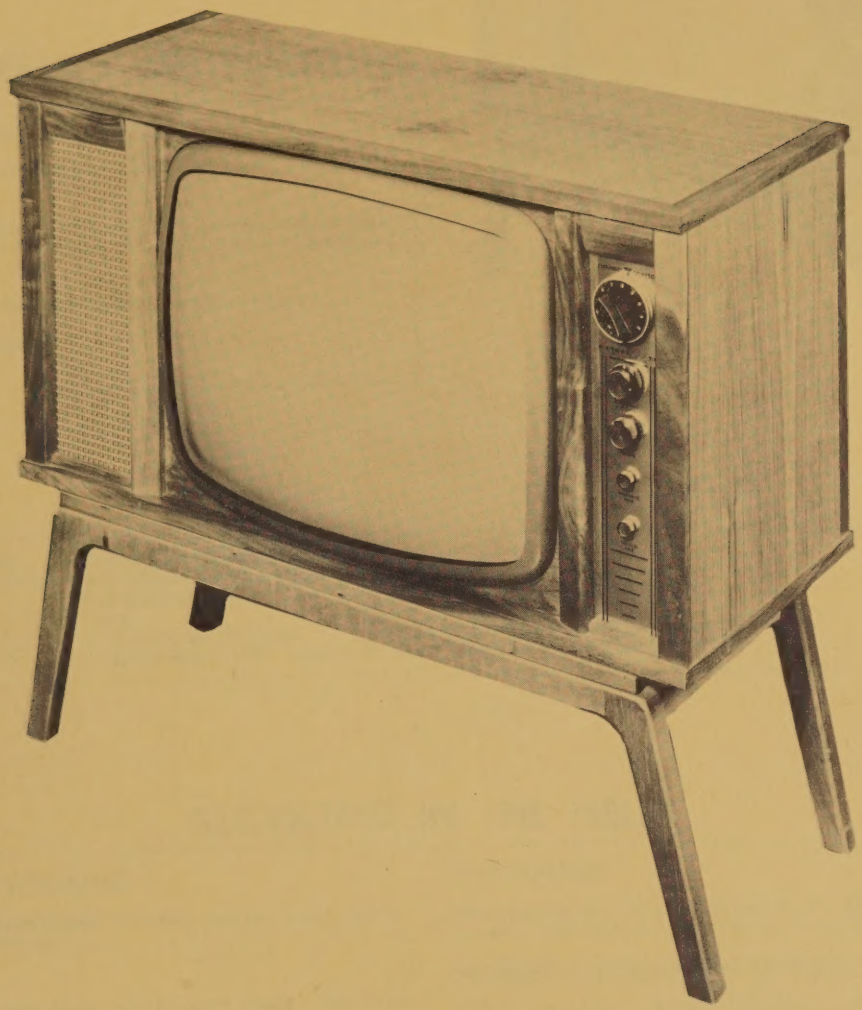
Schematic Diagram Courtesy of Western Auto Supply Co.

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

CURTIS MATHES
MODELS 7323, 9323

CURTIS MATHES
MODELS 7323, 9323



MODEL 7323

CURTIS MATHES
MODELS 7323, 9323

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

DATE 12-59

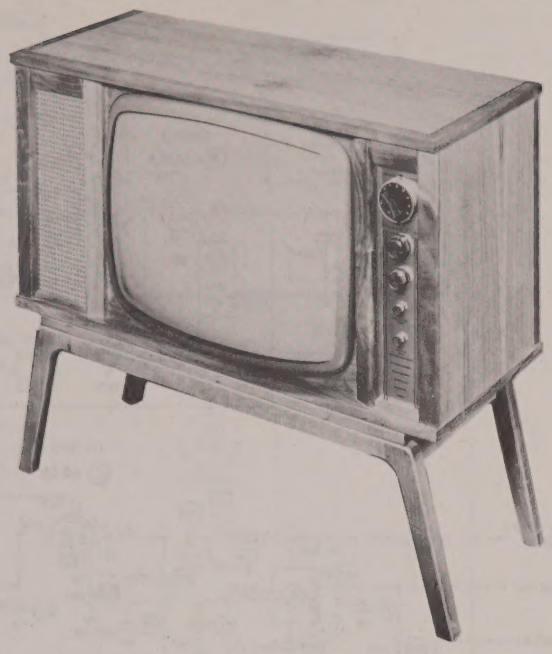
SET 468 FOLDER 1

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

CURTIS MATHES MODELS 7323, 9323

CURTIS MATHES MODELS 7323, 9323



MODEL 7323

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 7323

1. Remove 11 wood screws holding rear cover. Remove the rear cover.
2. Remove speaker lead, yoke plug, picture tube socket, HV lead, antenna leads, and picture tube mounting bracket ground wire.
3. Remove 5 chassis bolts from bottom of cabinet.
4. Remove chassis.

TRADE NAME	Curtis Mathes Models 7323, 9323
MANUFACTURER	Curtis Mathes Manufacturing Co., 2220 Young St., Dallas, Texas
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 210 Watts, 1.95 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is part of picture tube and cannot be removed for cleaning.

FUSE

One fuse is used for low voltage power supply. (For location, see "Tube Placement Chart".)
One fuse is used for filament protection. (For location, see M2, in photo "Power Chassis-Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of a Range control. (For location, see "Tube Placement Chart".)

FOCUS

No provision is made to vary the focus on this receiver.

SYNC STABILITY

Sync stability may be varied by means of a Sync Stabilizer control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke on the neck of the picture tube.

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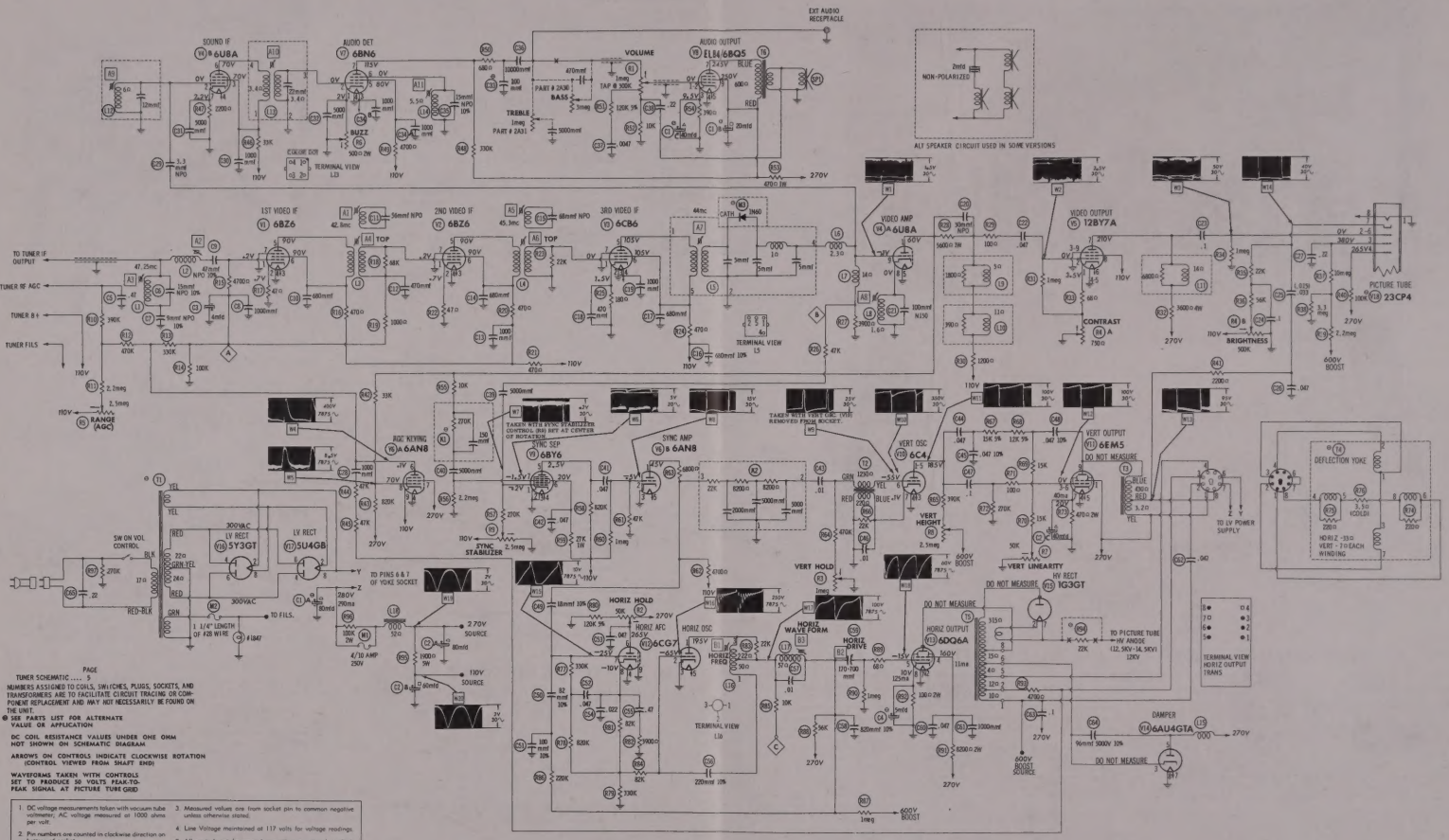
SET 468 FOLDER 1



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TUNER SCHEMATIC..... 5

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE GRID

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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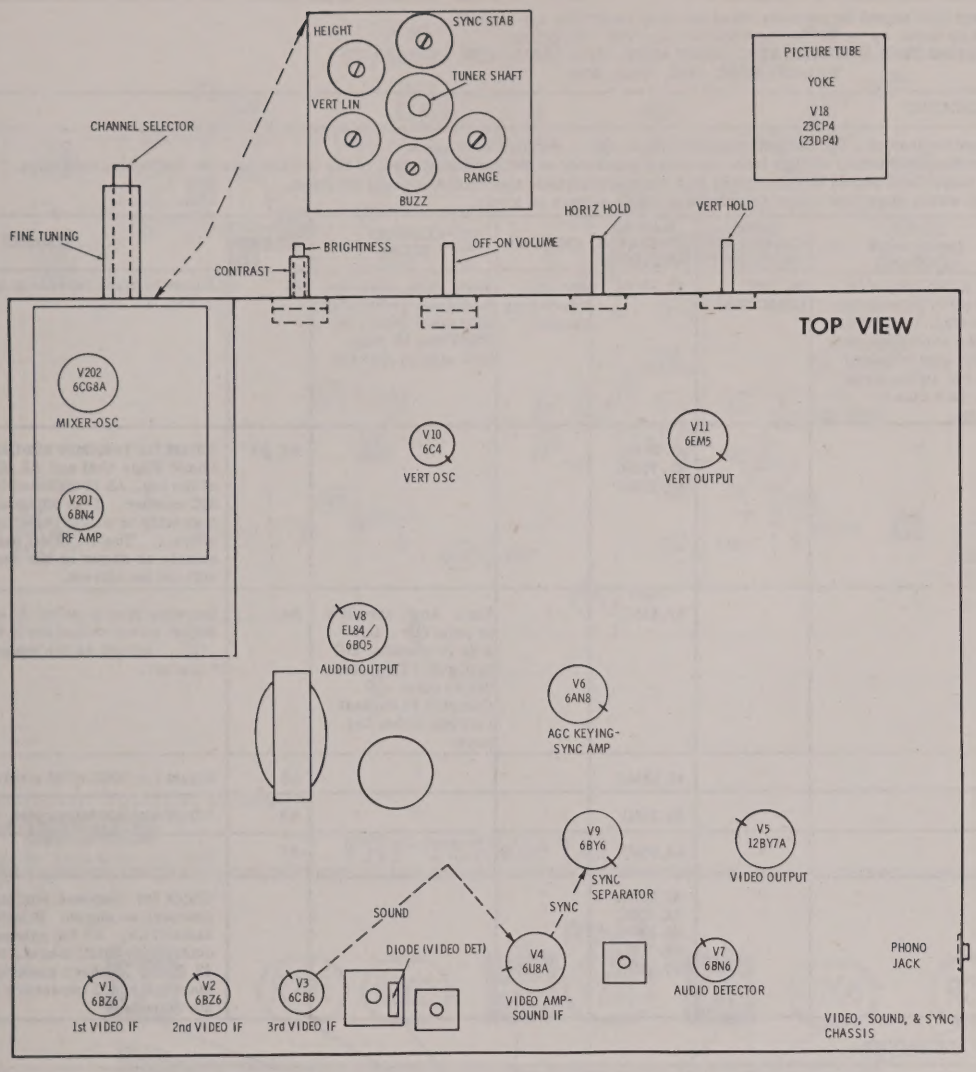
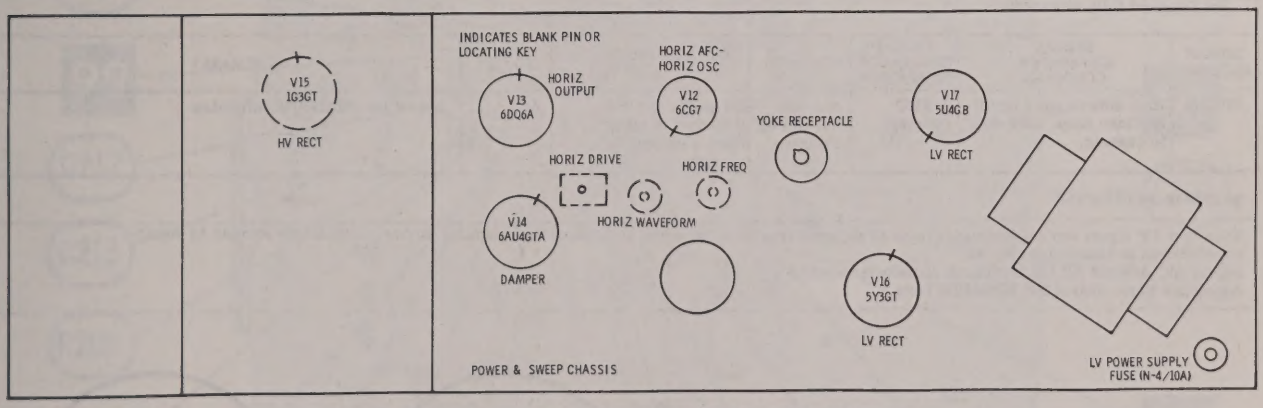
CURTIS MATHES
MODELS 7323, 9323

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), V16, V17, Fuse Wire (Fil.)

SWEEP FAILURE
No raster, has sound V12, V13, V14, V15, V18
No vertical deflection V10, V11
Poor vert. linearity or foldover V10, V11
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V16, V17, V13, V14
Vert. off freq. V10
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.)
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V18
Has pic, no sound V4, V7, V8
Overloaded picture V6

SYNC FAILURE
No vert. sync V9, V6
No horiz. sync V9, V6
No vert. or horiz. sync V9, V6

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools : GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓐ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.		Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 2nd Video IF Amp. Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.		"	"	41.25MC 45.75MC 47.25MC	"	"	A2, A3	Adjust for response similar to Fig. 2. Mixer Plate Coil and A2 affect the shape of the top. A3 is adjusted to position 47.25 MC marker. This adjustment must be made correctly or sound rejection will not be correct. The 45.75MC marker must be set exactly as shown or the overall response will not be correct.
3.		"	"	42.8MC	"	Vert. Amp. thru 10K to point Ⓑ . Low side to chassis. DC probe of VTVM thru 10K to point Ⓑ . Common to chassis. (Across Video Det. load)	A4	Increase bias at point A to -4.5 volts. Adjust sweep output for 2 volts DC at point Ⓑ . Adjust A4 for maximum amplitude at marker.
4.		"	"	41.25MC	"	"	A5	Adjust for MINIMUM amplitude at marker.
5.		"	"	45.3MC	"	"	A6	Adjust for maximum gain at marker.
6.		"	"	44.0MC	"	"	A7	"
7.		"	"	41.25MC 42.8MC 45.3MC 45.75MC 47.25MC	"	"		Check for response similar to Fig. 3 with markers as shown. If necessary, retouch SLIGHTLY, A7 for symmetry of top, A6 to control 45.75MC marker and A4 to control 42.8MC. Recheck position of trap frequency markers and if necessary retouch appropriate coil slugs.

4.5MC TRAP ALIGNMENT

Use 0-10 Volts AC scale on VTVM.
Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to pin 9 (grid) of Video Amp. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 7 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV signal and reduce signal level at antenna terminals, by using an attenuator or similar device, until a hiss similar to super-regeneration is heard in the sound.
Adjust A9, A10 and A11 for maximum undistorted sound.
Adjust the Buzz control for MINIMUM buzz.

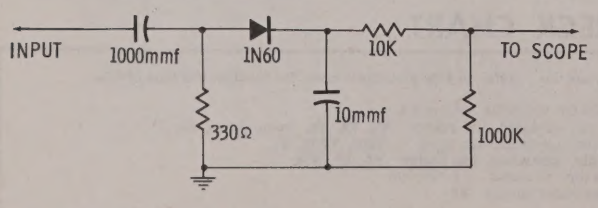


FIG. 1

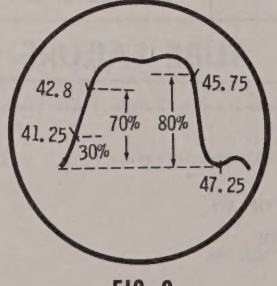


FIG. 2

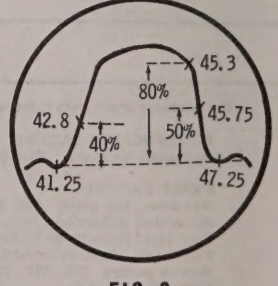
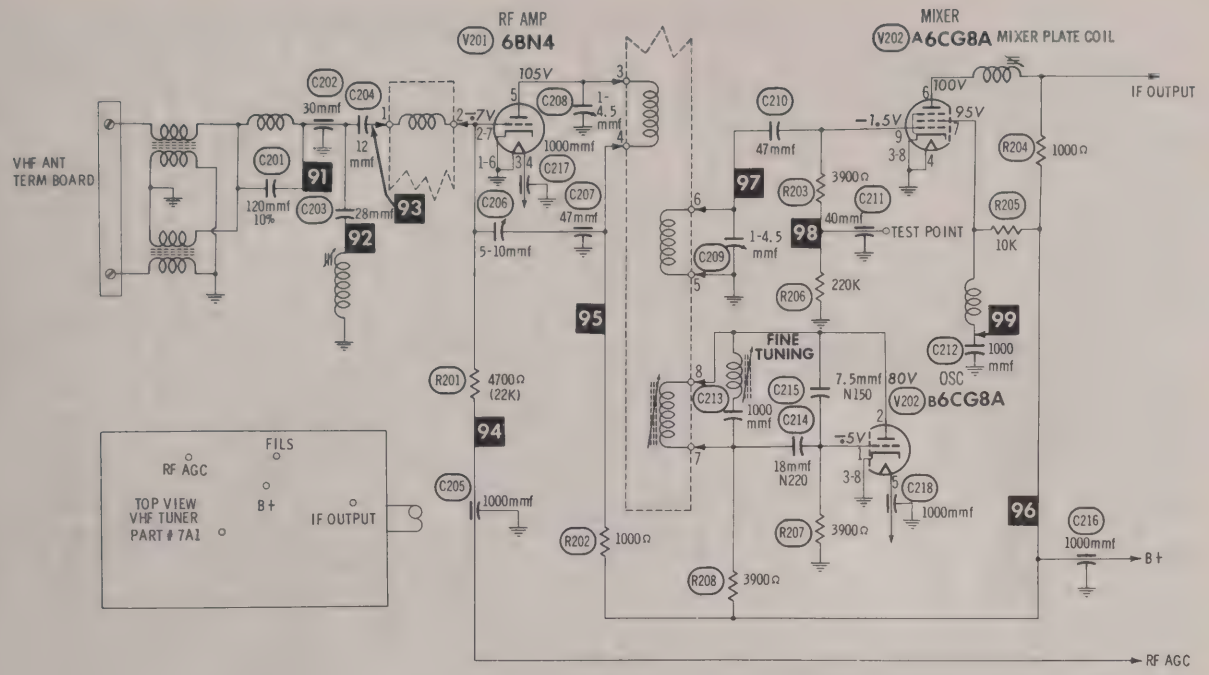


FIG. 3



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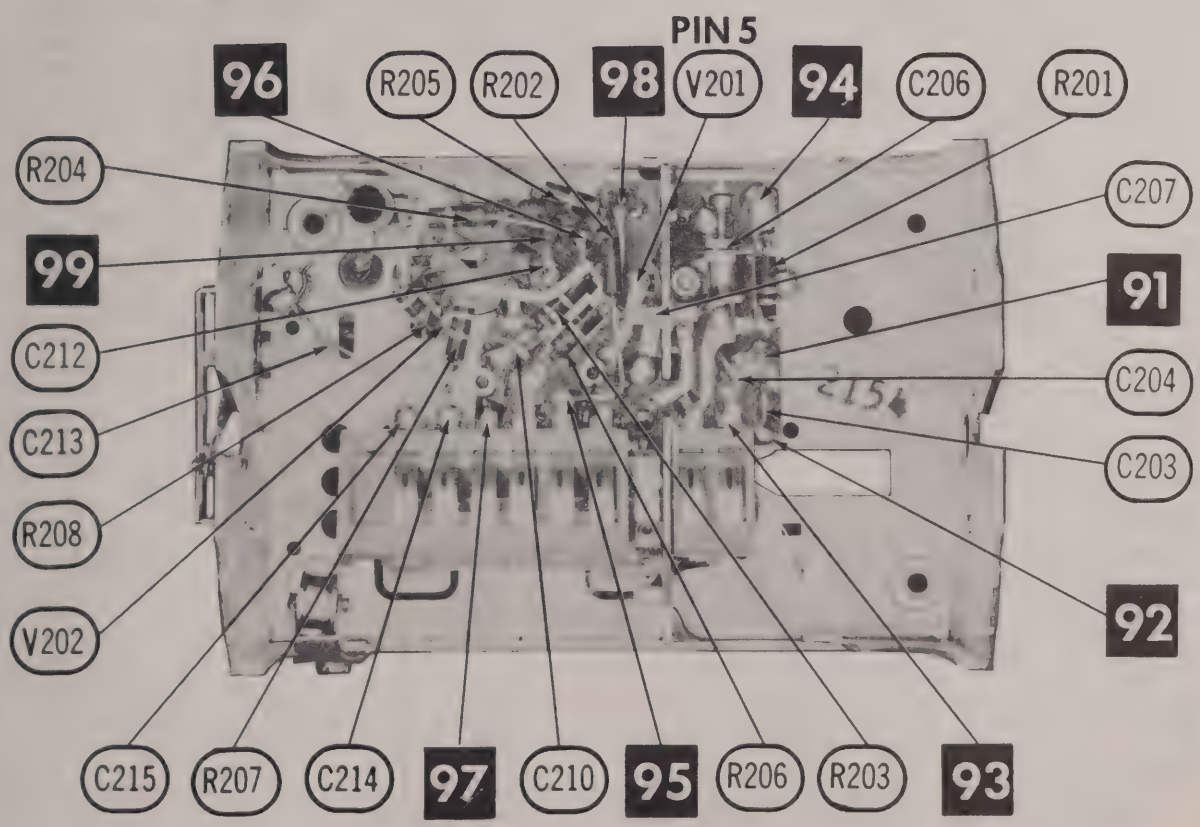
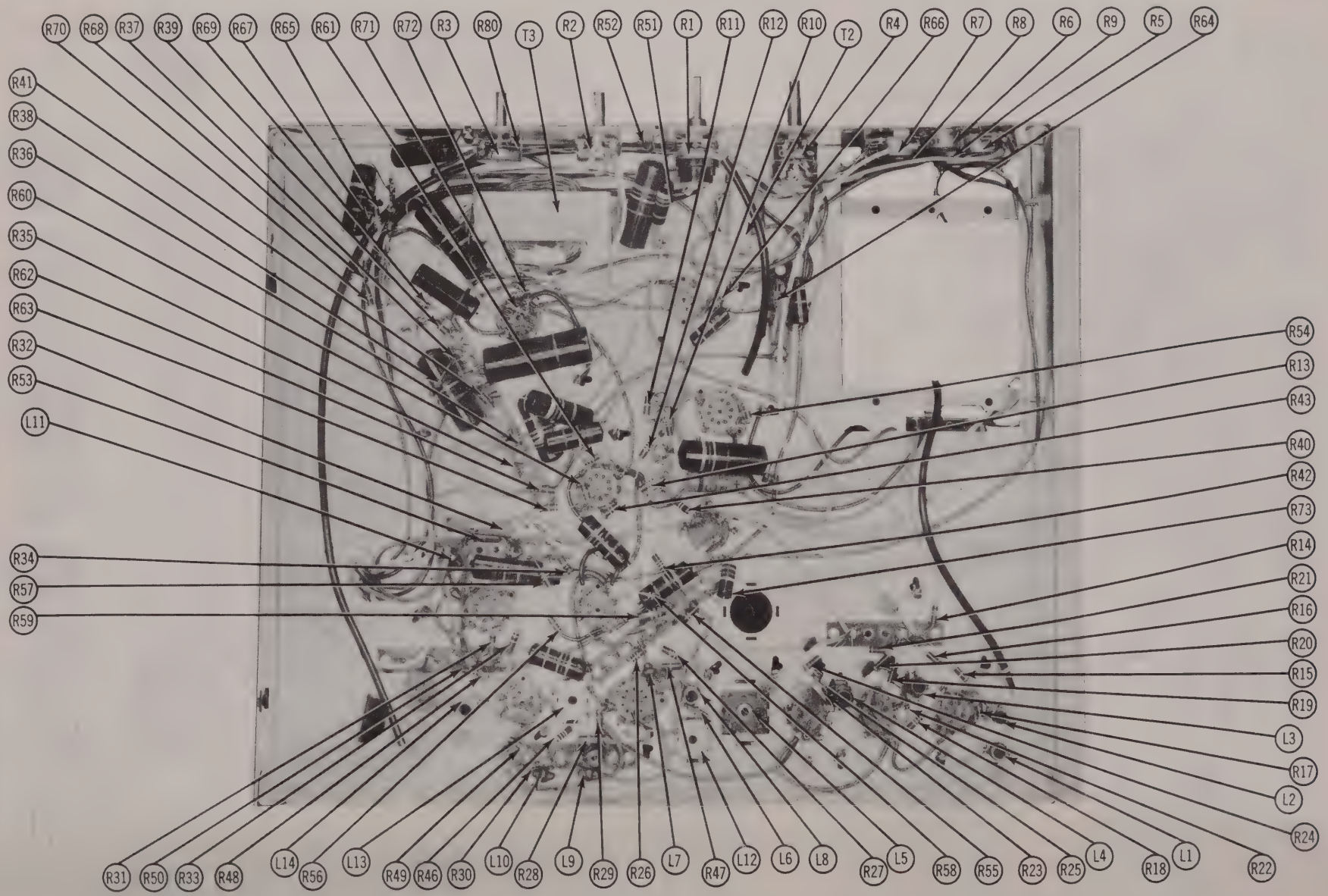
VHF TUNER 7A1

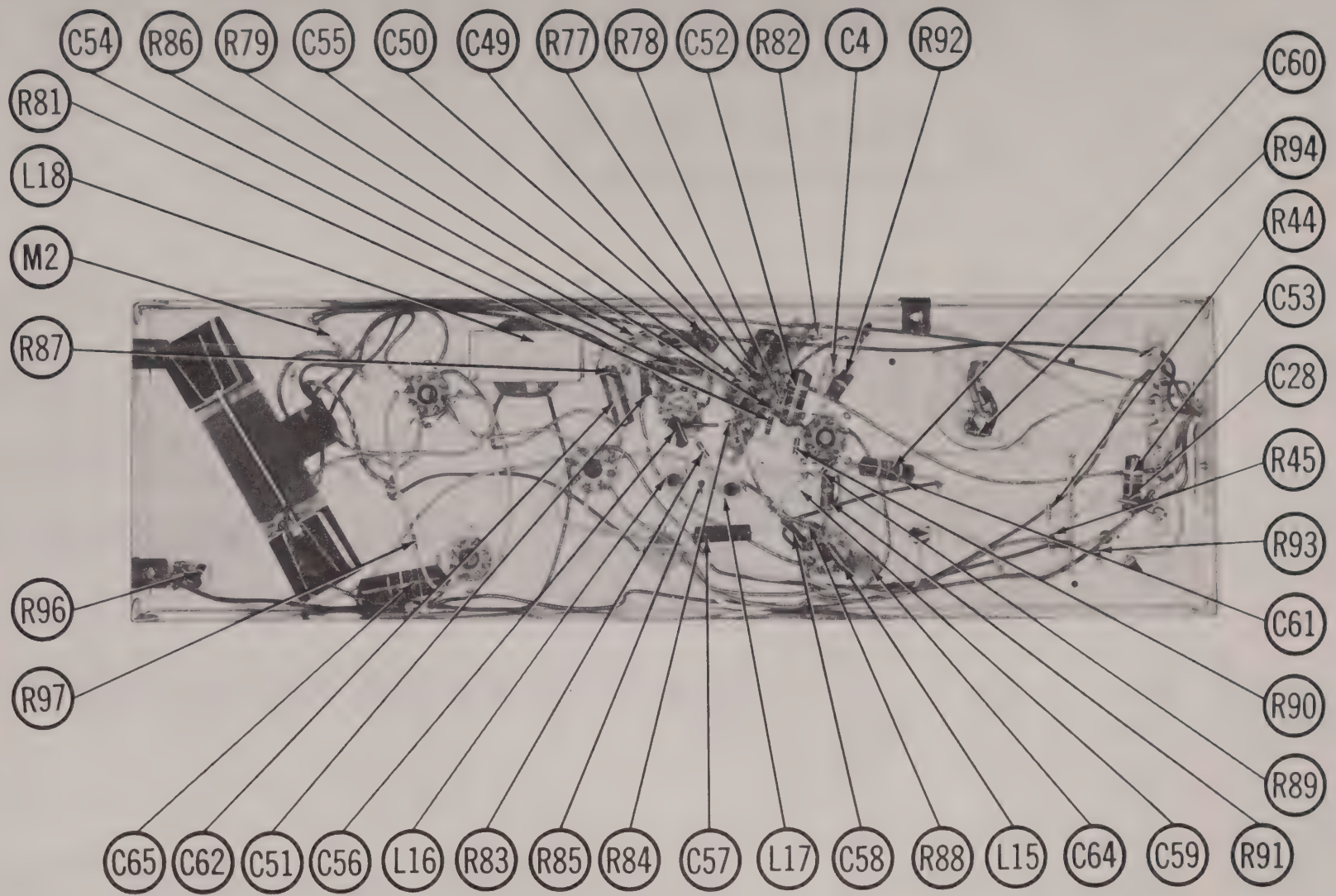


A Howard W. Sams CIRCUITRACE® Photo

TUNER 7A1 - BOTTOM VIEW



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENTIFICATION



POWER CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp.	6CB6
V4	Video Amp. - 2nd Sound IF Amp	6U8A
V5	Video Output	1HT7TA
V6	AGC Keying-Sync Amp.	6AN8
V7	Audio Detector	6BN6
V8	Audio Output	EL84/6BQ6
V9	Sync Separator	6BY6
V10	Vert. Osc.	6C4
V11	Vert. Output	6DM3
V12	Horiz. AFC-Horiz. Osc.	6CG7
V13	Horiz. Output	6DQ6A
V14	Damper	6AU4GTA
V15	RF Boost.	1GB5T
V16	LV Rect.	5Y3GT
V17	LV Rect	5U4GB

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: Curtis Mathes PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V18	23CP4 23DP4				23CP4	1 Aluminized 2 "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: Curtis Mathes PART No	AEROVOX PART No	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No.	NOTES
C1A	▲80	350	4A21	AFH3-29-75	C0237	FP378	TMT-43	TVLS-3641*	Note 1
B	▲20	350							
C	▲40	50							
C2A	▲80	350	4A20	AFH3-142-50	C0238	FP368.5	TMT-30	TVL-3643	
B	▲60	350							
C	▲40	50							
C3	4	50	4A19	PRS400	BBR4-50	TT50X4	TD-4-50	TVA-1402	
C4	5	50		SRE50V5	MLW5-50	TT50X5	ML5-50	TE-1305	Note 2

Note 1. Some versions may use 80mfd ▲ 350V, 20mfd ▲ 350V, 20mfd ▲ 50V in this application.
Note 2. Some versions may use 4mfd ▲ 50V in this application (Part #4A19).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.47 300V		P388N-47		CUB3P47	2DP-5-474	GEM-2047	2TM-P47
C6	15 NPO 10%		NPO-DI 15	DTZ-15	CUQ15C	CCTO-150	CNO-415	10TCC-Q15
C7	9 NPO 10%		NPO-DI 10	DTZ-10	CUQ9C	CCTO-100	CNO-410	10TCC-V9
C8	1000		BPD-001	DD-102	BYA10D	CCD-102	B-210	5HK-D10
C9	47 NPO 10%		NPO-DI 47	DTZ-47	CUQ47C	CCTO-470	CNO-447	5GA-Q47
C10	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	5GA-T68
C11	56 NPO			TCZ-56	CUQ56C	CCTO-560	CNO-456	10TCC-Q56
C12	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C13	1000		BPD-001	DD-102	BYA10D	CCD-102	B-210	5HK-D10
C14	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	5GA-T68
C15	68 NPO		NPO-DI 68	DTZ-68	CUQ68C	CCTO-680	CNO-468	10TCC-Q68
C16	680 10%		DI-680	DD-681	IRS7B8	CCD-681	GP368	10TS-T68
C17	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	5GA-T68
C18	470		BPD-00047	DD-470	BYA10T47	CCD-471	B-347	5GA-T47
C19	1000		BPD-001	DD-102	BYA10D	CCD-102	B-210	5HK-D10
C20	30 NPO		NPO-DI 33	TCZ-30	CUQ3C	CCTO-300	CNO-433	10TCC-Q30
C21	100 N150					**		10TCP-T10
C22	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C23	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C24	.1 200V		P388N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C25	.033 600V	(.015)*	P588N-033	DD-333	CUB5S3	6DP-3-333	GEM-6133	6TM-S33
C26	.047 600V		P588N-047	DD-503	CUB5S47	6DP-3-473	GEM-6147	6TM-S47
C27	.22 600V		P588N-22		CUB5P22	6DP-5-224	GEM-6022	6TM-P22
C28	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C29	3.3 NPO		NPO-DI 3.3	DTZ-3R3	CI0Y3C	CCTO-3R3	CNO-533	10TCC-V33
C30	1000		BPD-001	DD-102	BYA10D	CCD-102	B-210	5HK-D10
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C32	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C33	100	(1000mmf) †	BPD-0001	DD-101		CCD-101	B2X100	5GA-T10
C34A	1000		BPD-2X001	DD8-102	BYD6DD8	CCD-102	B2X210	5HK-D10
B	1000					CCD-102		
C35	15 NPO 10%		NPO-DI 15	DTZ-15	CUQ15C	CCTO-150	CNO-415	10TCC-Q15
C36	10000		BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10
C37	.0047 300V		P288N-0047	DE-472	CUB2D47	2DP-4-472	GEM-5247	5TM-D47
C38	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C39	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C40	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C41	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C42	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C43	.01 400V		P488N-01	DD-103	CUB4S	4DP-1-103	GEM-411	4TM-S1
C44	.047 600V		P588N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C45	.047 600V 10%		V64C6847-10%		P48D47	4DP-3-473	GEM-4015	4TM-S47
C46	.01 600V		P488N-01	DD-103	CUB4S47	4DP-1-103	GEM-411	4TM-S1
C47	1 600V		P588N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C48	.047 600V 10%		V64C6847-10%		P48D47	4DP-3-473	GEM-4015	4TM-S47
C49	18 10%		1469-000018	DD-180	22R5G18	CM-20B-180K		MS-418
C50	82 10%		1469-000082	DD-820	22R5G82	CM-20B-820K		MS-482
C51	100 10%		1469-0001	DD-101	22R5T1	CM-20B-101K	MCB33	MS-310
C52	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C53	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C54	.033 200V		P288N-033	DD-333	CUB2S33	4DP-2-333	GEM-4123	2TM-S33
C55	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C56	220 10%		1469-00022	DD-221	22R5T22	CM-20B-221K	MCB227	MS-322
C57	.01 400V		P488N-01	DD-103	CUB4S	4DP-1-103	GEM-411	4TM-S1
C58	820 10%		1469-00082	DD-821	1R5T82	CM-20B-821K	MCB251	MS-382
C59	170-700					468		
C60	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C61	1000		BPD-001	DD-102	BYA10D1	CCD-103	B-210	5HK-D10
C62	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C63	.1 600V		P588N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C64	96 500DV 10%							
C65	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22

* Alternate value. † Used in models with Tone control.
** Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Curtis Mathes PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1meg	½	2A29				PR16T25 (DS-3713Shaft)	Volume
B	300K Stop Switch						Not Req.	Push-Push Off-On
R2A	50K	½	2A32	AB-31	A47-50K-S	Q11-123	U36	Horiz. Hold
B	Shaft			AK-6	B8-5/16	NQ	D8-37	
R3A	1meg	½	2A33	AB-69	A47-1meg-S	Q11-137	U54	Vert. Hold
B	Shaft			AK-8	B8-3/16	NQ	D8-37	
R4A	1000	½	2A23	F1-2				Contrast
B	500K	½		R2-40		? Q7-1134	■ UB407S	Brightness
R5A	2.5meg	½	2A35	AB-83	B47-2.5meg-S	B11-239	SU-865	Range (AGC)
B	Shaft			AK-1	Not Req.	T364	Not Req.	
R6	500Ω	2(4W)	2A11	WW-501	39-500	112-500	FL500	Buzz
R7A	50K	½	2A34	AB-31	B47-50K-S	B11-123	SU-39	Vert. Lin.
B	Shaft			AK-1	Not Req.	T364	Not Req.	
R8A	2.5meg	½	2A25	AB-83	B47-2.5meg-S	B11-239	SU-865	Height
B	Shaft			AK-1	Not Req.	T364	Not Req.	
R8A	2.5meg	½	2A25	AB-83	B47-2.5meg-S	B11-239	SU-865	Sync Stabilizer
B	Shaft			AK-1	Not Req.	T364	Not Req.	

† "Concentrikit" Equivalent. K-15 Kit with Base Elements & Shafts: B11-105, P17-026 (Panel) B11-153, R1-105 (Rear)

■ "STA-LOC" Equivalent. FA751L, RU551, OF812, 1S1187.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	390K	
R11	2.5meg	
R12	470K	
R13	330K	
R14	100K	
R15	4700Ω	
R16	470Ω	
R17	47Ω	
R18	68K	
R19	1000Ω	
R20	470Ω	
R21	470Ω	
R22	47Ω	
R23	22K	
R24	470Ω	
R25	180Ω	
R26	47K	
R27	3900Ω	
R28	5600Ω 1W	
R29	100Ω	
R30	1200Ω	
R31	1meg	
R32	3600Ω 4W	
R33	68Ω	
R34	1meg	
R35	22K	
R36	56K	
R37	10meg	
R38	3.3meg	
R39	2.2meg	

ITEM No.	RATING	REMARKS
R40	100K	
R41	2200Ω	
R42	33K	
R43	820K	
R44	47K	
R45	47K	
R46	33K	
R47	2200Ω	
R48	330K	
R49	4700Ω	
R50	680Ω	
R51	120K 5%	
R52	10K	
R53	470Ω 1W	
R54	390Ω	
R55	10K	
R56	2.2meg	
R57	270K	
R58	620K	
R59	27K 1W	
R60	1meg	
R61	47K	
R62	4700Ω	
R63	6800Ω	
R64	470K	
R65	390K	
R66	22K	
R67	15K 5%	
R68	12K 5%	
R69	15K	

ITEM No.	RATING	REMARKS
R70	15K	
R71	100Ω	
R72	270K	
R73	470Ω 2W	
R74	220Ω	Note 1
R75	220Ω	Note 1
R76	3.5Ω Cold	Note 1
R77	330K	
R78	820K	
R79	330K	
R80	120K 5%	
R81	82K	
R82	3900Ω	
R83	33K	
R84	82K	
R85	10K	
R86	220K	
R87	1meg	
R88	56K	
R89	68Ω	
R90	1meg	
R91	82000 2W	
R92	100Ω 2W	
R93	4700Ω	
R94	22K	Note 2 #8A17
R95	1900Ω 5W	
R96	100K 2W	
R97	270K	

Note 1. Part of T4. Note 2. Not used in some versions. # Curtis Mathes Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Curtis Mathes PART No.	Gramer PART No	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	1A12	17-4538 ■	17-4538 ■	TV-153 ■			
L2	1st Video IF	1A13	17-4538	17-4538				
L3A	2nd Video IF	1A14						
B	47.25MC Trap							
L4A	3rd Video IF	1A15						
B	41.25MC Trap							
L5A	4th Video IF	1A16						
B	RF Choke							
L6	Resonant Choke	1A34						30uh
L7	Shunt Peaking Coil	1A41	19-3180	19-3180	TV-184	6180	VP-5	180uh
L8	4.5MC Trap	1A17	20-1004	20-1004		1470	SF-3	
L8	Shunt Peaking Coil	1A43						30uh ①
L9	Shunt Peaking Coil	1A42	19-3190 ▲	19-3190 ▲	TV-194 ▲	6112 ▲	VP-3 ▲	100uh ②
L11	Shunt Peaking Coil	1A46	19-3180 *	19-3180 *	TV-184 *	6180 *	VP-5 *	180uh ③
L12	1st Sound IF	1A18						
L13	2nd Sound IF	1A19	17-3495	17-3495	TV-113	6203	SF-2	
L14	Quadrature Coil	1A20	20-1005	20-1005	TV-121	1480		
L15	RF Choke	1A33	19-1001	19-1001	BC-582	4804		1.5Ω

■ Disregard tap.
▲ Parallel with 390Ω resistor.
* Parallel with 6800Ω resistor.

① Wound on 1800Ω resistor.
② Wound on 390Ω resistor.
③ Wound on 6800Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L16	72Ω		1A31	HS-7	TV-185	6312		HS-7	Horiz. Osc. tapped ▲ 50Ω
L17	57Ω		1A23	HS-8		6314		HS-8	Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	.290A	52Ω	1.5 Hy	10A13	26C44				26C44	C-23X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ▲ 1.95A	600VCT ▲ 290A	5V ▲ 9A	12A6-1 ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ▲ 9A									

① Horizontal Chassis use Part #12A6-1

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Curtis Mathes PART No	Halldorson PART No	Merit PART No	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
T2	Vert Osc	10A11	26A05	V406	VB01	VBO19	VBO-201	26A05	A-122X
T3	Vert Output	10A9	26B14	V319				26B14	A-140X
T4	Yoke-Horiz (12MH) (110°)-Vert (0.5MH)	1A26-2 1		Y-110 2 3			DY-27A 2 3 4 5	Y-52 2 3	Y-80 & NW-23 3
	Alt. Yoke	1A31							
T5	Horiz. Output	1A25	FLY-150* 5	HVO-118 * 5	X167 * 5		HO-289* 5	FLY-150* 5	D-150 *

1 Includes R74, R75 and R76
2 Use original rear cover and centering device.
3 Use original yoke plug and connect same as original.
4 Use original yoke damping network, if necessary.
5 Drill new mounting hole(s)

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL (CONNECTION)	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	5	5	5	5	5	5	5
	6	4	4	4	4	4	4	4
	5	3	3	3	3	3	3	3
	2	NC See Note 5	NC See Note 5	NC See Note 5		NC See Note 5	NC See Note 5	7
	1	1	1	1		1	1	1
Connect Width Coil Across →		⑥	⑥	⑥		⑥	⑥	⑥
Special Notes →								

5 Remove resistor (R33) from circuit. Install new horizontal damping network, consisting of 1000Ω resistor and approximately 75mmf ▲ 2KV MINIMUM capacitor, across horizontal yoke terminals #2 and #.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	5200Ω	6-8Ω	10A10	24S92	A-2903 ▲	AU-809	A-2313	24S92	S-55X	1 Drill new mounting hole.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: Curtis Mathes PART No	QUAM PART No	NOTES
SP1	6"	PM	3-4Ω	W6CV6	6A1	

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Curtis Mathes PART No	REPLACEMENT DATA	
K1	Sync Sep Grid	150mmf, 270K		Note 1	
K2	Vert. Integrator	2000mmf, 5000mmf, 8000mf, 8200Ω, 22K		Aerovox Centralab Cornell-Dubilier Sprague Mallory	PA-130 PC-100 1HTM2 V-1/V-3 MS-100

Note 1. Component Combination (150K and 330mmf) used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Curtis Mathes PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	4/10A 250V			333.400 (N-4/10A-250V)	346009	N 4/10	HN 3/10 to 1/2
M2	1 1/4" length of #28 Wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Curtis Mathes PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N60 *		1N60	1N60	1N60	Video Detector (Pigtail)

* Alternate Type CK706A.

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M4	Tuner	7A1	VHF

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	11B8-1	Channel Selector
Knob	11B9	Fine Tuning
Knob	11B7-1	Brightness
Knob	11B6-1	Contrast
Knob	11B10	Horiz., Vert. Hold
Knob	11B3-1	Tone

WIRING DATA

High Voltage Lead	Use BELDEN No.	8659
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

CHASSIS BOTTOM VIEW - CAPACITOR IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

7A1

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6BN4	V202	Mixer-Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 10%		DI-120	DTZ-120	L10T12	CCD-121	CNO-312	10TCC-T12
C202	30							
C203	28		DI-27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C204	12		DI-12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	5-10			829-10				
C207	47							
C208	1-4.5			829-6				
C209	1-4.5			829-6				
C210	47		DI-47	DD-470	L10Q47	CCD-470	CNO-447	10TCC-Q47
C211	40							
C212	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C213	1000		DI-1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C214	18 N220					*		10TCR-Q18
C215	7.5 N150					*		
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	4700Ω	(22K) *
R202	1000Ω	
R203	3900Ω	

ITEM No.	RATING	REMARKS
R204	1000Ω	
R205	10K	
R206	220K	

ITEM No.	RATING	REMARKS
R207	3900Ω	
R208	3900Ω	

* Alternate value.

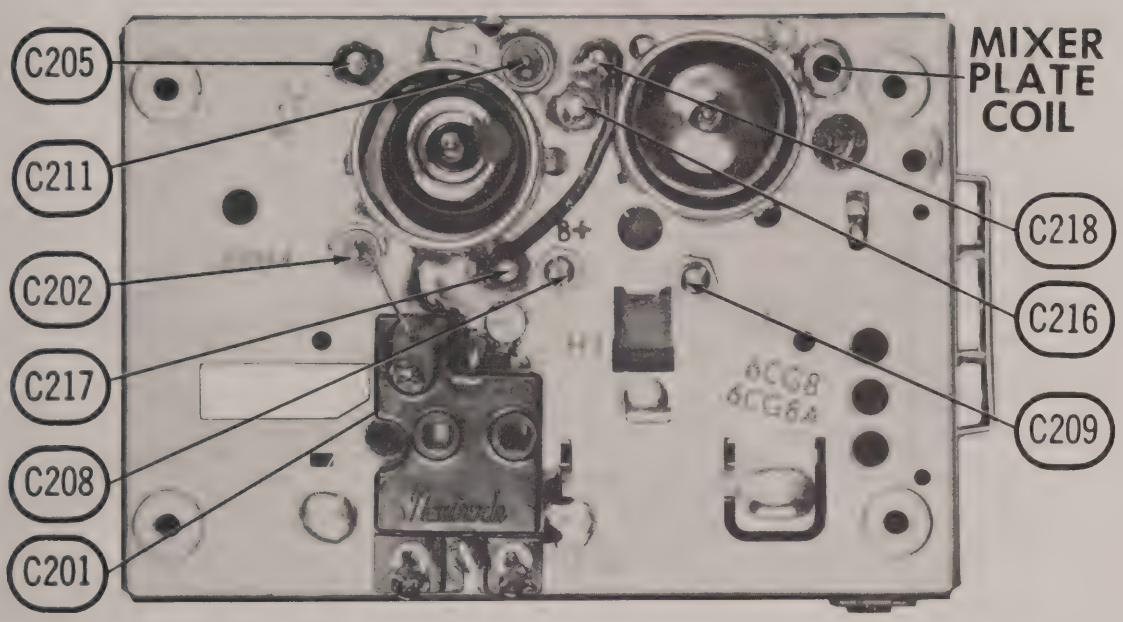
TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

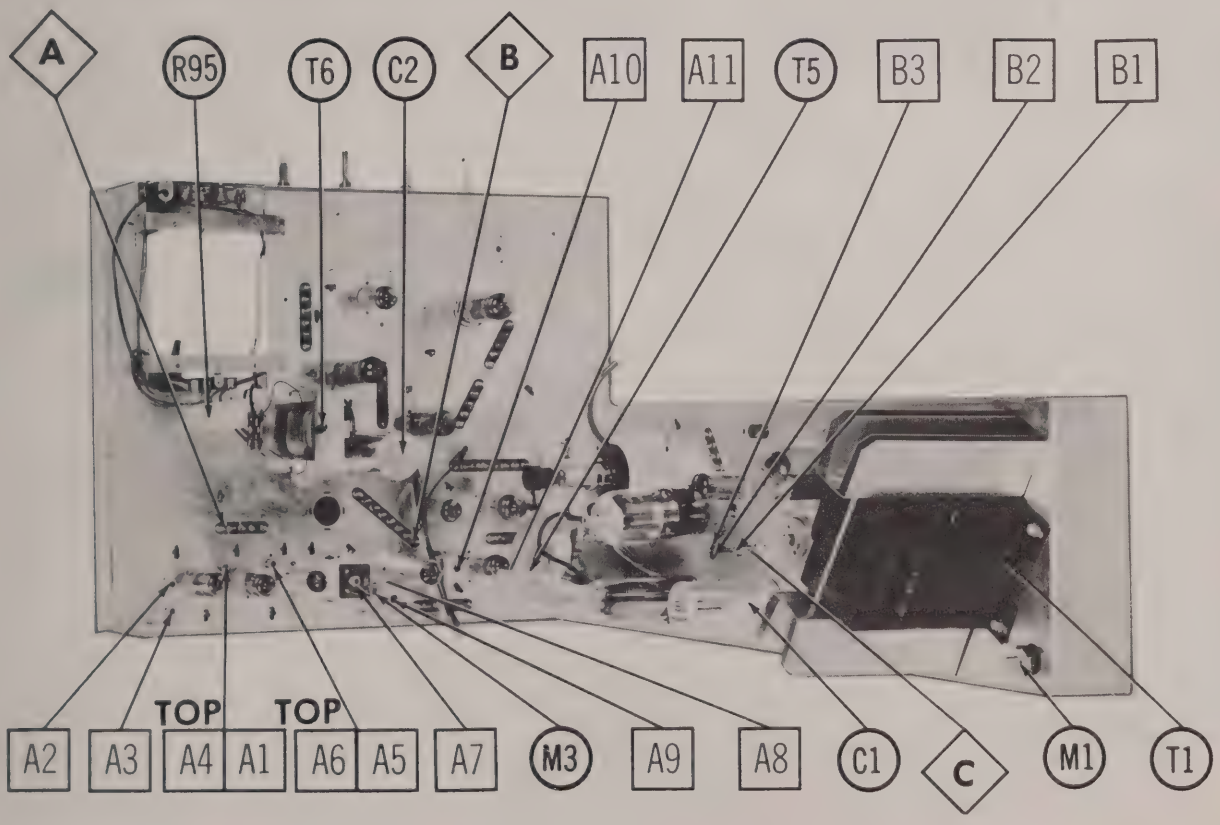
The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



TUNER 7A1 - TOP VIEW

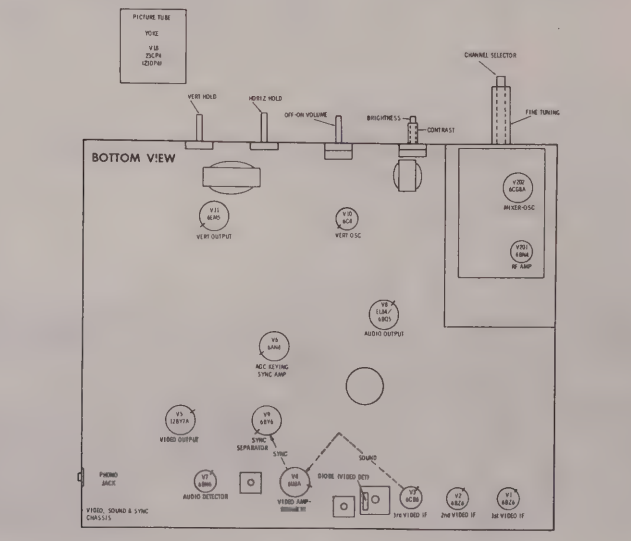


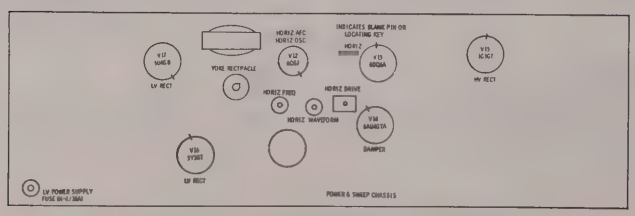
CHASSIS - TOP VIEW

RESISTANCE MEASUREMENTS

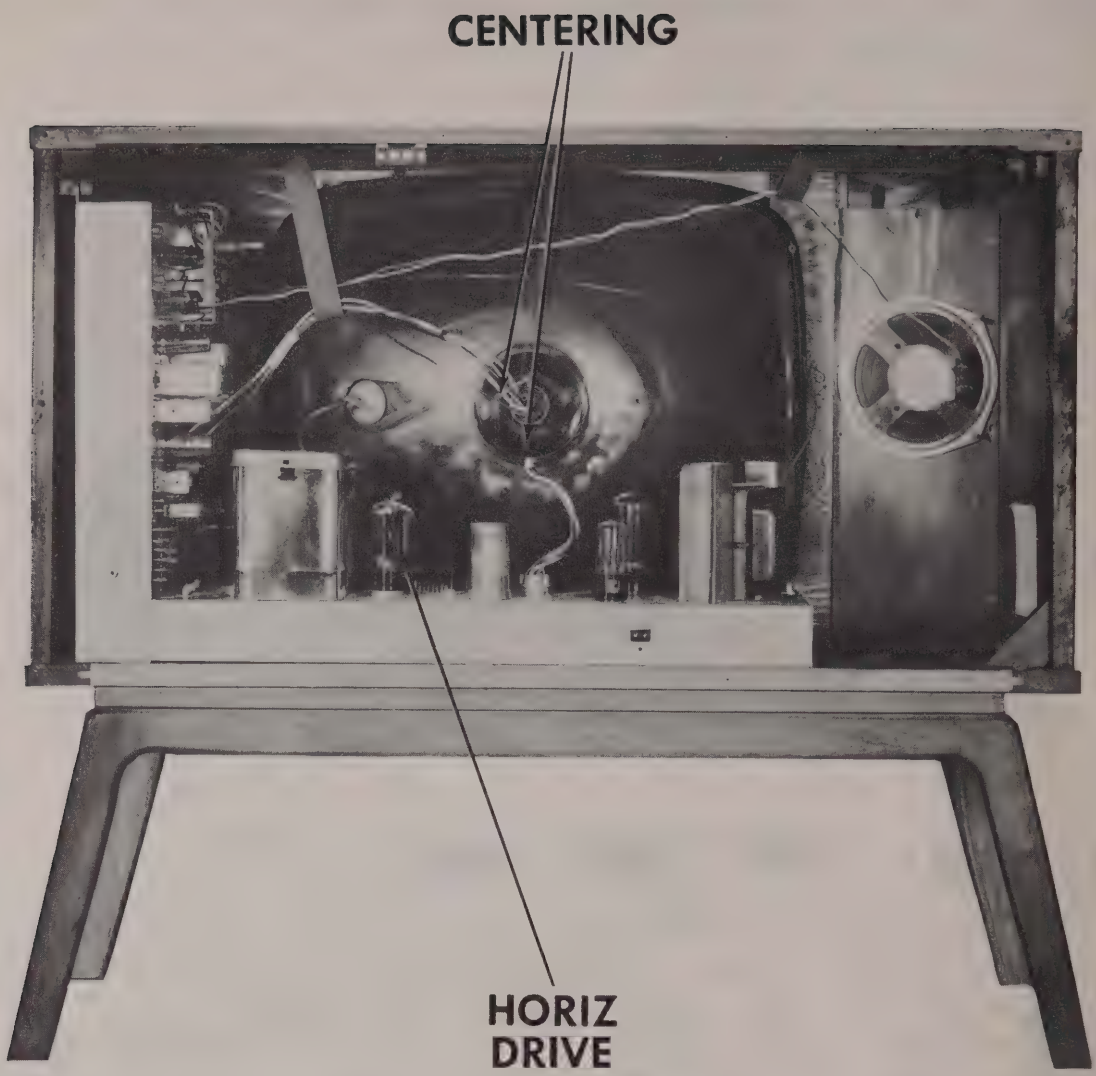
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	100K	47Ω	.1Ω	0Ω	†2800Ω	†2800Ω	0Ω		
V2	6BZ6	100K	47Ω	.1Ω	0Ω	†2800Ω	†2800Ω	0Ω		
V3	6CB6	.1Ω	180Ω	0Ω	.1Ω	†2350Ω	†2350Ω	0Ω		
V4	6U8A	†6000Ω	6Ω	†35K	.1Ω	0Ω	†35K	2200Ω	1.7Ω	3900Ω
V5	12BY7A	• 180Ω	1meg	0Ω	0Ω	0Ω	.1Ω	†3600Ω	†1900Ω	0Ω
V6	6AN8	†13K	47K	0Ω	0Ω	.1Ω	430K	†0Ω	†40K	†1900Ω
V7	6BN6	•370Ω	3.5Ω	.1Ω	0Ω	†6600Ω	5.5Ω	†330K		
V8	EL84/ 6BQ5	10K	10K	390Ω	0Ω	.1Ω	NC	†1000Ω	NC	†470Ω
V9	6BY6	• 650K	0Ω	0Ω	.1Ω	†820K	†29K	2.2meg		
V10	6C4	• ¶1meg	NC	.1Ω	0Ω	• ¶1meg	1meg	220Ω		
V11	6EM5	†0Ω	TP	270K	0Ω	.1Ω	270K	470Ω	NC	†430Ω
V12	6CG7	†56K	410K	0Ω	0Ω	.1Ω	•†2000Ω	1.5meg	410K	0Ω
V13	6DQ6A	NC	.1Ω	NC	†8200Ω	1meg	NC	0Ω	100Ω	TOP CAP †15Ω
V14	6AU4GTA	TP	NC	¶1meg	NC	†.1Ω	NC	.1Ω	0Ω	
V15	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †330Ω
V16	5Y3GT	NC	¶	NC	22Ω	NC	24Ω	NC	¶	
V17	5U4GB	NC	¶	NC	24Ω	NC	22Ω	NC	¶	
V18	23CP4	0Ω	1meg	†11meg	†100K	NC	1meg	• 90K	.1Ω	
V201	6BN4	0Ω	1.1meg	0Ω	.1Ω	†2900Ω	0Ω	1.1meg		
V202	6CG8A	3900Ω	†5800Ω	0Ω	0Ω	.1Ω	†2900Ω	†12K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 270V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.
NC NO CONNECTION.
TP TIE POINT.





TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:

B1, B3... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519
B2 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

Turn the Horizontal Hold control fully clockwise. Tune in a station and adjust the Horizontal Frequency slug (B1) until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast control fully counterclockwise and the Brightness control clockwise so that the picture appears washed out. Turn the Horizontal Drive trimmer (B2)clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of the scope to point Ⓒ. Low side to chassis. Adjust the Horizontal Waveform slug (B3) until the round and sharp peaks of the waveform are equal in amplitude. (See Fig. 4). Keep the picture in sync during this adjustment.

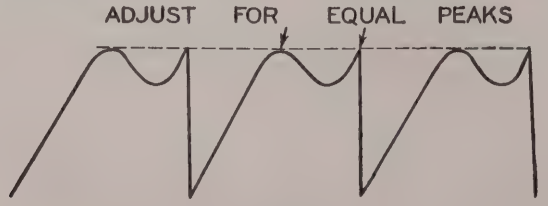


FIG. 4

PHOTOFACT* Folder

EIA MEMBER

MOTOROLA CHASSIS
TS-561, Y, WTS-561

MOTOROLA CHASSIS
TS-561, Y, WTS-561

MOTOROLA CHASSIS
TS-561, Y, WTS-561

MODEL 21K124M (Ch. TS-561)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA CHASSIS TS-561, Y, WTS-561

MOTOROLA CHASSIS TS-561, Y, WTS-561

MODEL 21K124M (Ch. TS-561)

TRADE NAME	Motorola	MODELS	CHASSIS
		A21K137B, A21K137M, A21T69BG, A21T69MG (With Remote Control)	WTS-561
		Y21K124B, Y21K124M, Y21K124W, Y21T66BZ, Y21T66CH	TS-561Y
		21K124B, 21K124M, 21K124W, 21T66BZ, 21T66CH	TS-561
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Television Receiver		
TUBES	TV: Seventeen (VHF), Eighteen (UHF), Remote Control: Two		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 160 Watts, 1.52 Amp. @ 117 Volts AC, Less Remote Control		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 (UHF), Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 5 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

Two fuses are used. One for low voltage power supply and one for horizontal sweep circuit protection. (For location, see "Tube Placement Chart".)
One fuse wire is used for filament protection.(For location, see M2 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove rear cover.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug (B1). (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Horizontal Size control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENTS

To eliminate intercarrier buzz, adjust the Noise Suppressor control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the 2 magnets so that all the sides are straight.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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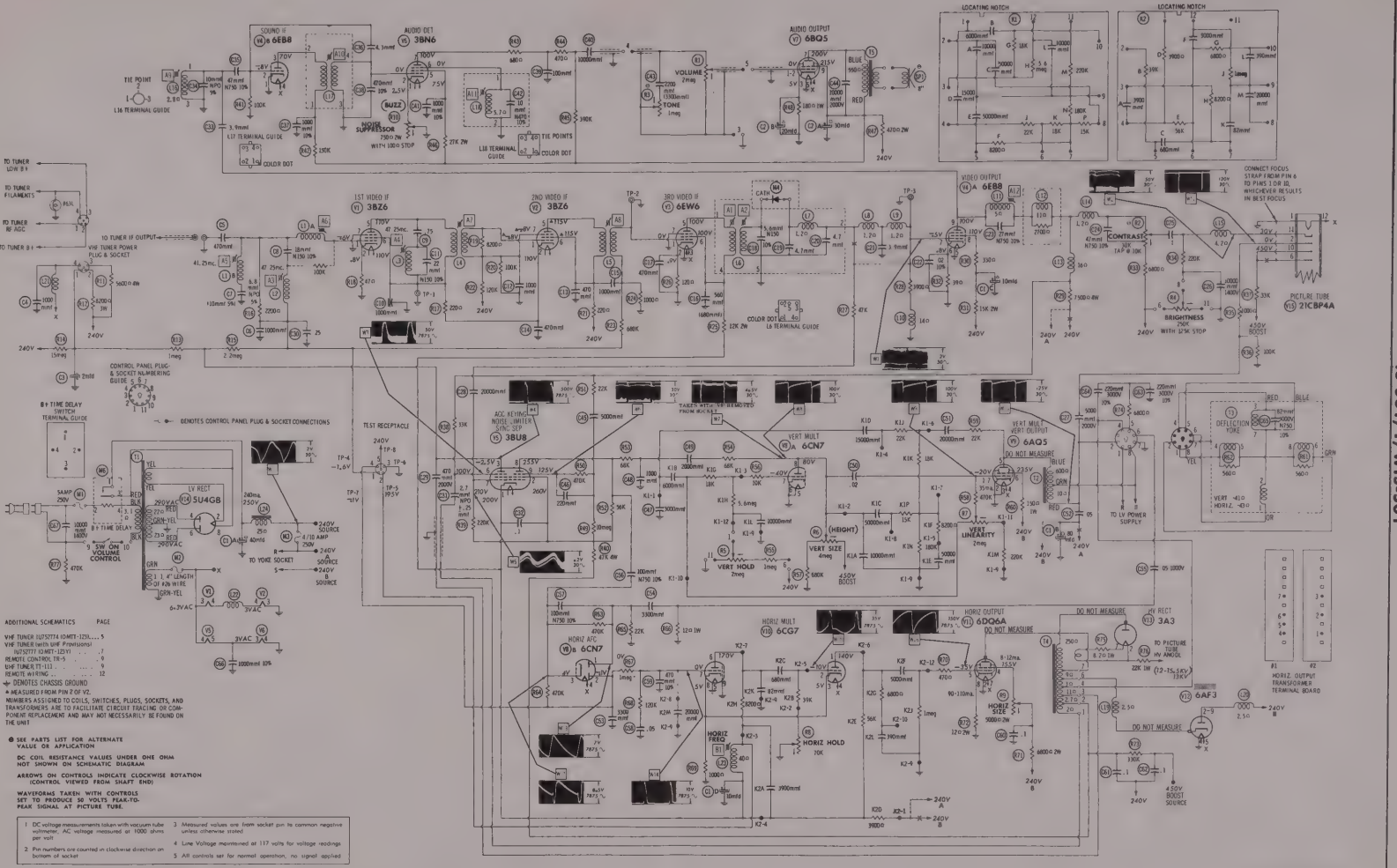
JA679

SET 468 FOLDER 2


SOUND IF V4 6EB8
AUDIO DET V5 3BN6
AUDIO OUTPUT V7 6BQ5
VOLUME 2meg
TONE 1meg
BUZZ SUPPRESSOR 750Ω 2W WITH 100Ω STOP
TIE POINTS
L16 TERMINAL GUIDE
L17 TERMINAL GUIDE
COLOR DOT
TO TUNER LOW B+
TO TUNER FILAMENTS
TO TUNER RF AGC
TO TUNER B+
TO TUNER IF OUTPUT
VHF TUNER POWER PLUG & SOCKET
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 6EW6
CATH
L8 TERMINAL GUIDE
VIDEO OUTPUT V4 6E8B
CONTRAST 50K TAP @ 10K
BRIGHTNESS 250K WITH 125K STOP
CONNECT FOCUS STRAP FROM PIN 6 TO PINS 1 OR 10, WHICHEVER RESULTS IN BEST FOCUS
PICTURE TUBE V15 21CBP4A
450V BOOST
CONTROL PANEL PLUG & SOCKET NUMBERING GUIDE
B+ TIME DELAY SWITCH TERMINAL GUIDE
DENOTES CONTROL PANEL PLUG & SOCKET CONNECTIONS
ACC KEYING NOISE LIMITER V9 3BU8
TEST RECEPTACLE
VERT MULT V8A 6CN7
VERT MULT VERT OUTPUT V8 6AQ5
DO NOT MEASURE
TAKES WITH CRT REMOVED FROM SOCKET
DEFLECTION YOKE
TO LV POWER SUPPLY
VERT SIZE 4meg
VERT HOLD 2meg
VERT LINEARITY 2meg
(HEIGHT)
450V BOOST
LV RECT V14 5U4GB
B+ TIME DELAY
SW ON VOLUME CONTROL
TO YOKE SOCKET
240V SOURCE
HORIZ AFC V9B 6CN7
HORIZ MULT V10B 6CG7
HORIZ OUTPUT V11 6DQ6A
HV RECT V13 3A3
TO PICTURE TUBE HV ANODE
HORIZ FREQ
HORIZ HOLD 70K
HORIZ SIZE 2.5
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
V12 6AF3
LOCATING NOTCH
LOCATING NOTCH
TIE POINT
L16 TERMINAL GUIDE
COLOR DOT
L8 TERMINAL GUIDE
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 1UT5TT4 10-MTT-125L ... 5
VHF TUNER (with UHF Provisions) 1UT52TT7 10-MTT-125Y1 ... 7
REMOTE CONTROL TR-5 ... 9
UHF TUNER TT-111 ... 9
REMOTE WIRING ... 12
DENOTES CHASSIS GROUND
MEASURED FROM PIN 2 OF V2.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied

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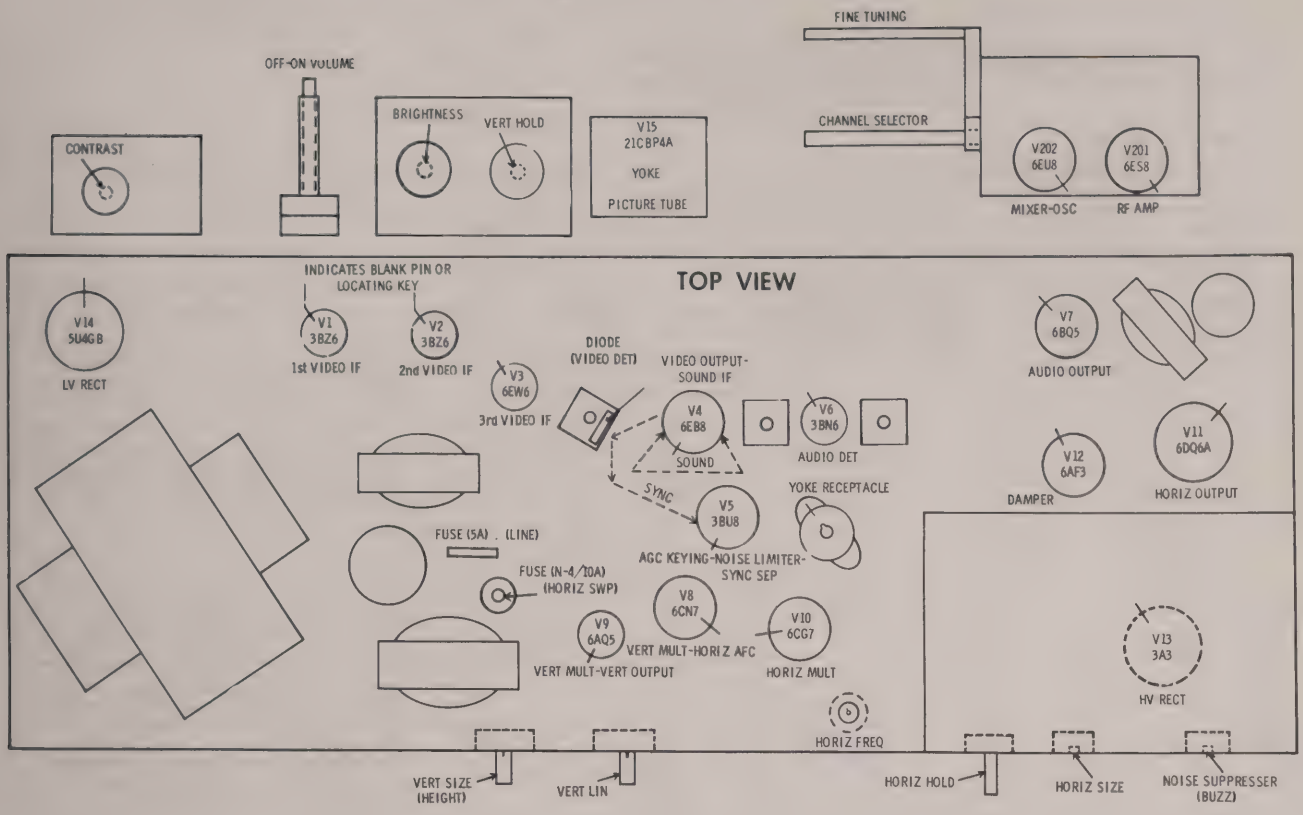
MOTOROLA CHASSIS
TS-561, Y, WTS-561

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

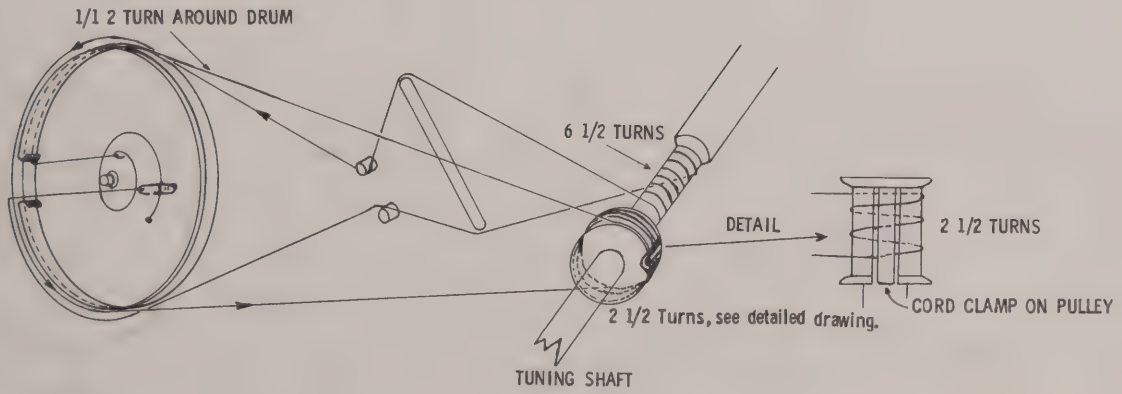
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V14, Thermal Switch, Fuse (Line), Fuse Wire (F1)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V15
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, V14
Vert. off freq. V8
Horiz. off freq. V8, V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5



UHF DIAL CORD STRINGING

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Remove yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500 ohm 50 watt resistor from TP-8 to TP-6. (CAUTION: TP-8 has B+ voltage on it.) Set Contrast fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 4.5 volt bias supply to point TP-4 . Positive to chassis.
Maintain between 2 and 5 volts peak to peak on scope except where otherwise noted in the procedure.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp.)	45.75MC	Any non-interfering channel	Vert. amp. thru 47K to TP-3. Low side to chassis (across Video Det. load.)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Peak with maximum core separation.
2.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube V202 and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	47.25MC	"	"	A3, A4	Increase scope gain. Remove bias if necessary. Adjust to place marker in trap notch as in Fig. 2. Tune slugs at end of coil away from chassis.
3.	"	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis.
4.	"	"	"	41.25MC 42.25MC 44.0MC 45.75MC 47.25MC	"	"	Mixer Plate coil and A6	Set scope for 3 volts peak to peak. Restore 6 volts bias. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate coil affects the center peak. A7 affects the two outside peaks. Tune slugs at end of coil away from the chassis. If suckout (trap affects) occurs, detune A7 to remove.
5.	"	"	"	42.25MC 45.75MC	"	Vert. amp. thru 47K to TP-3. Low side to chassis (across Video Det. Load.)	A7, A8	Adjust A7 to place 42.25MC marker at 60%. Adjust A8 to place 45.75MC marker at 50% on other side (See Fig. 4). Tune slug at end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A7 and A8 for correct response.

SOUND IF ALIGNMENT

Tune in a TV signal and adjust all controls for a normal picture.
Reduce the signal level by use of an attenuator or similar device until a hiss similar to super-regeneration is heard in the sound.
Adjust A9, A10, A11 and the Noise Suppressor (Buzz) control for maximum undistorted sound. If the hiss disappears during alignment, reduce signal until hiss returns.

4.5 MC TRAP ALIGNMENT

Tune in a strong TV signal and turn Contrast fully clockwise. Adjust Fine Tuning until a beat pattern is seen in the picture. Adjust A12 to find the two points at which the beat pattern is just noticeable on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.)

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6, 15

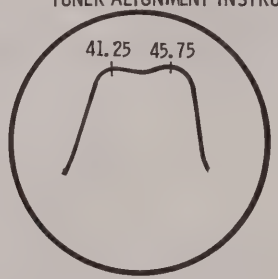


FIG. 1

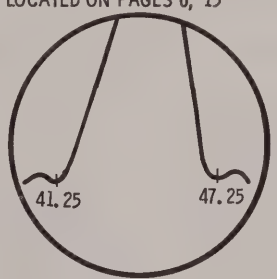


FIG. 2

FIG. 3

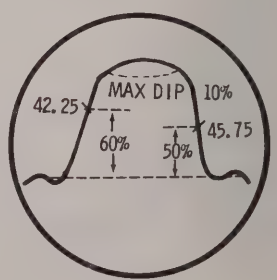
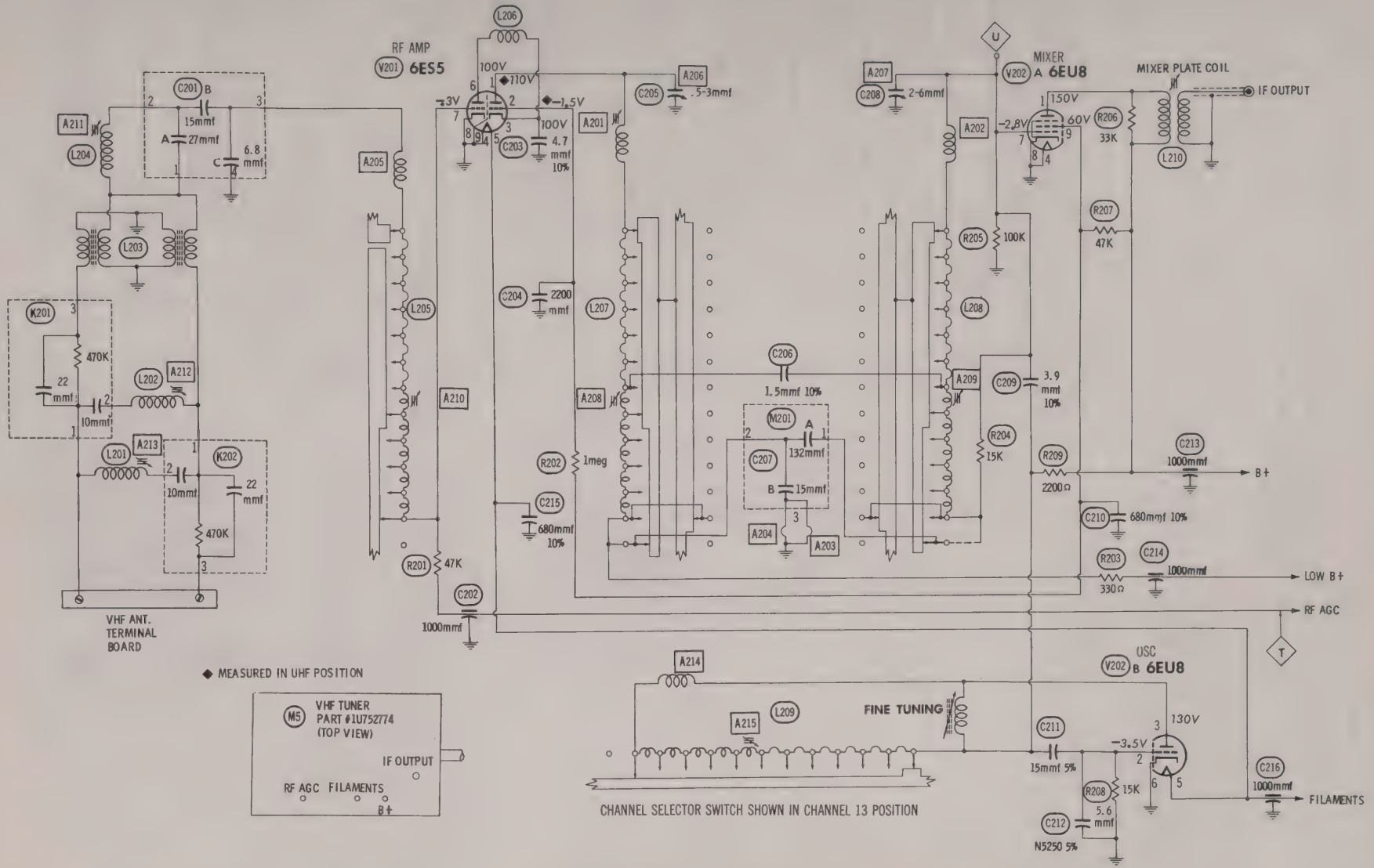


FIG. 4



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VHF TUNER 1U752774 (OMTT-123)

MOTOROLA CHASSIS TS-561, Y, WTS-561

TUNER ALIGNMENT INSTRUCTIONS

1U752774(OMTT-123)

PRE-ALIGNMENT INSTRUCTIONS

Remove the deflection yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 3 to pin 5 of the Service Test Receptacle.
DO NOT remove the tuner cover.
Suggested Alignment Tools: A206, A207 ..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A208 thru A213... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point Ⓣ to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Preset A206 and A207 so top of screw is .35" above tuner chassis.
Use 10MC sweep unless otherwise noted.

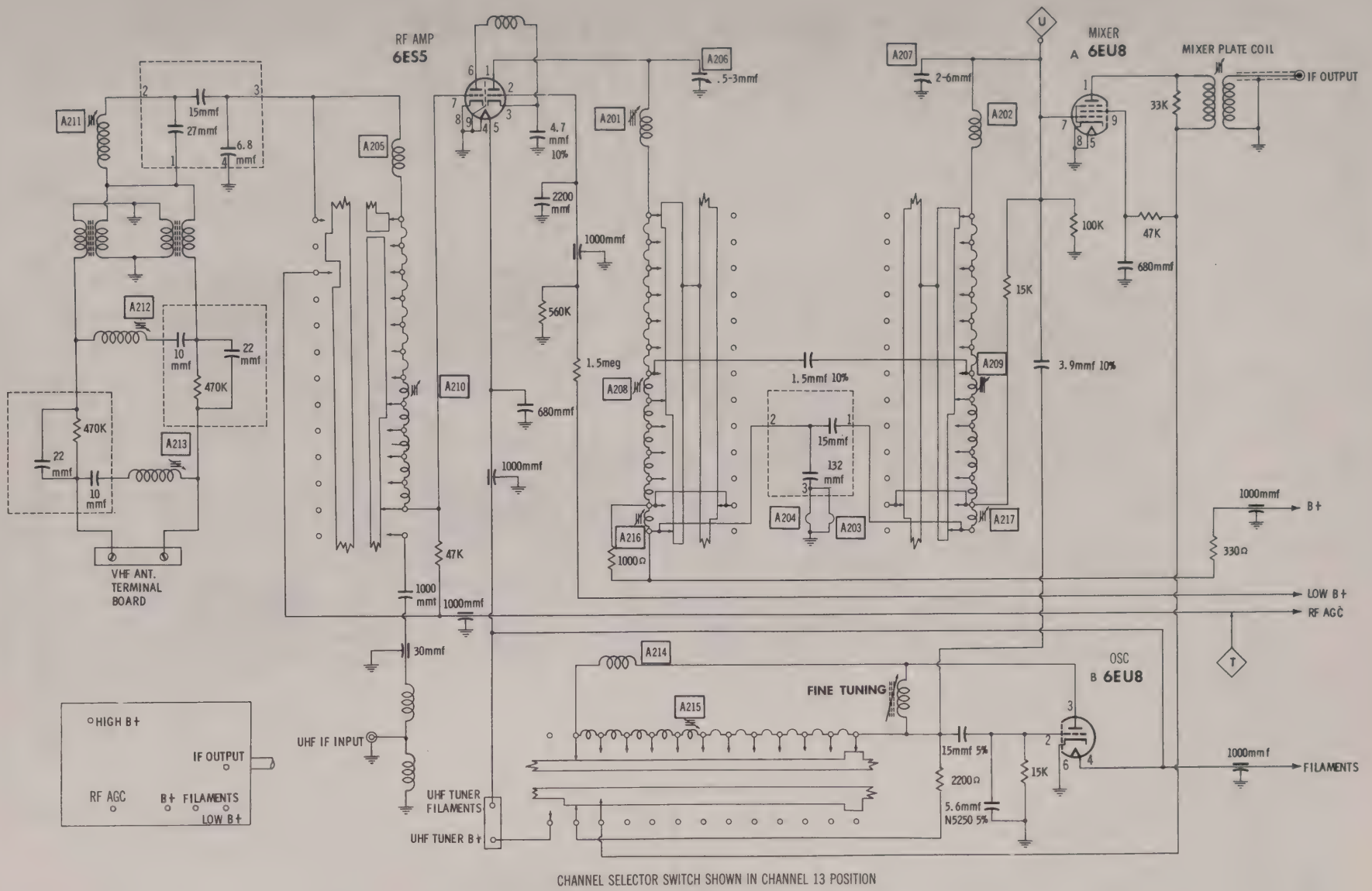
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point U . Low side to chassis.	A201, A202	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2.	"	"	"	"	"	"	A203, A204	Adjust for proper bandwidth as in Fig. 201.
3.	"	"	"	"	"	"	A205	Adjust for maximum amplitude and MINIMUM tilt.
4.	"	"	177MC	175.25MC 179.75MC	7	"	A206, A207	Adjust A206 for proper marker position. Adjust A207 for MINIMUM tilt.
5.	"	"	85MC	83.25MC 87.75MC	6	"	A208, A209, A210	Adjust A208 to place 83.25MC marker on or near peak, A209 to place 87.75MC marker on or near other peak and A210 for maximum gain and MINIMUM tilt.
6.	"	"	"	94MC	"	"	A211	Adjust for MINIMUM response at marker or until it just starts to affect the high frequency side of response curve. NOTE : A211 may be adjusted to trap out interference between 85 and 108MC. However, make certain that no part of a desired channel is trapped out.
7.	"	"	79MC	77.25MC 81.75MC	5	"		Check for response similar to Fig. 201. If necessary make compromise adjustment of A208, A209 and A210 for proper curve on each channel.
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			
8.	"	"	57MC	43.5MC 45.5MC	2	"	A212, A213	Adjust A212 for MINIMUM response at 43.5MC marker and A213 for MINIMUM response at 45.5MC marker. Retouch either or both for flat response consistent with MINIMUM amplitude at trap frequencies.

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. thru 47K across Video Det. load	A214	Adjust to place marker in trap notch as in Fig. 202.
10.	"	"	207MC	209.75MC	12	"		Marker must fall into trap notch on each channel within plus or minus 750KC of specified marker frequency. If not, make compromise adjustment of A214 for all high band channels.
			201MC	203.75MC	11			
			195MC	197.75MC	10			
			189MC	191.75MC	9			
			183MC	185.75MC	8			
			177MC	179.75MC	7			
11.	"	"	85MC	87.75MC	6	"	A215	Adjust to place marker in trap notch as in Fig. 202.
12.	"	"	79MC	81.75MC	5	"		Marker must fall into trap notch on each channel within plus or minus 750KC of specified marker frequency. If not, make compromise adjustment of A215 for all low band channels.
			69MC	71.75MC	4			
			63MC	65.75MC	3			
			57MC	59.75MC	2			

continued PAGE 15



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

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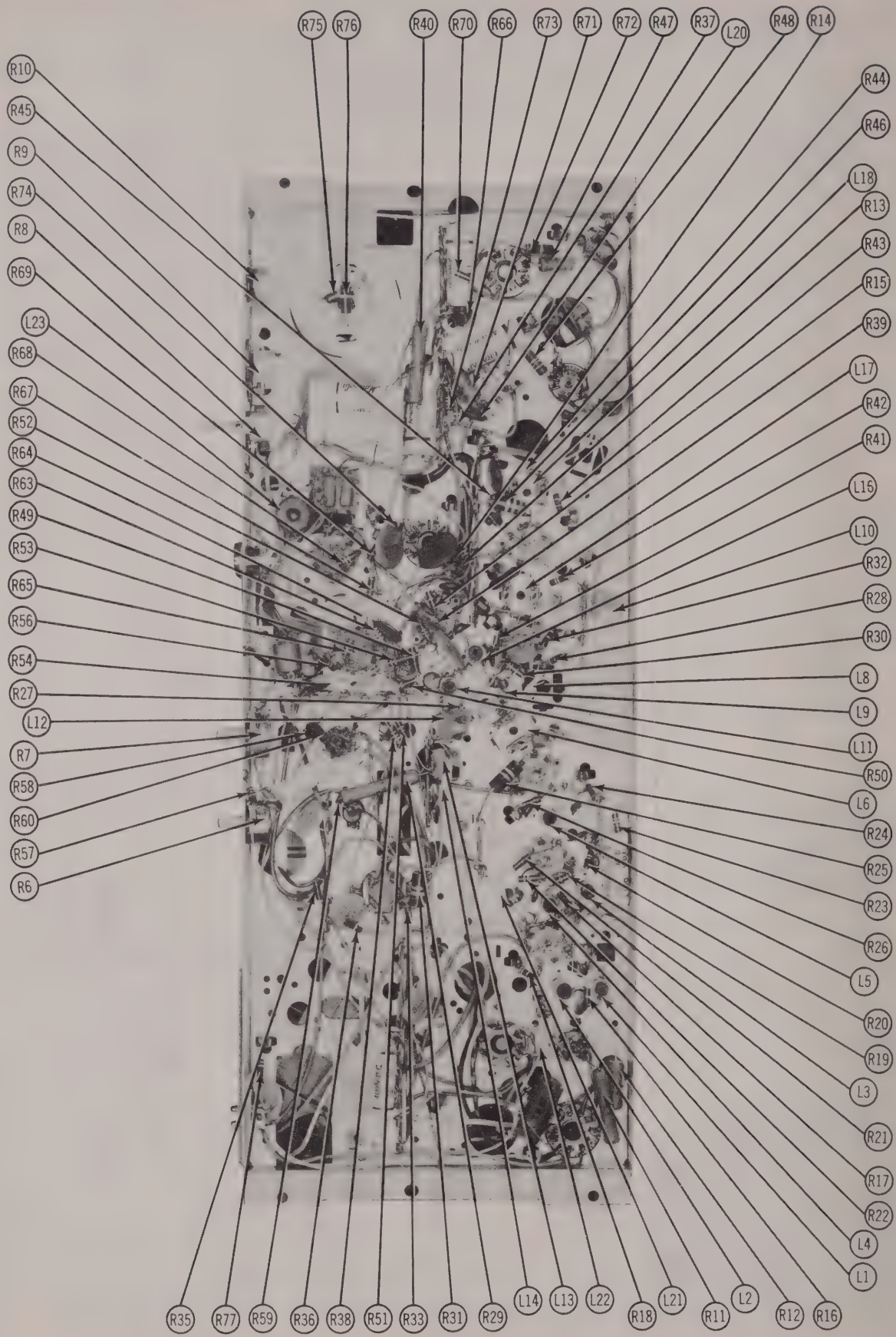
VHF TUNER with UHF provisions 1U752777 (OMTT-123Y)

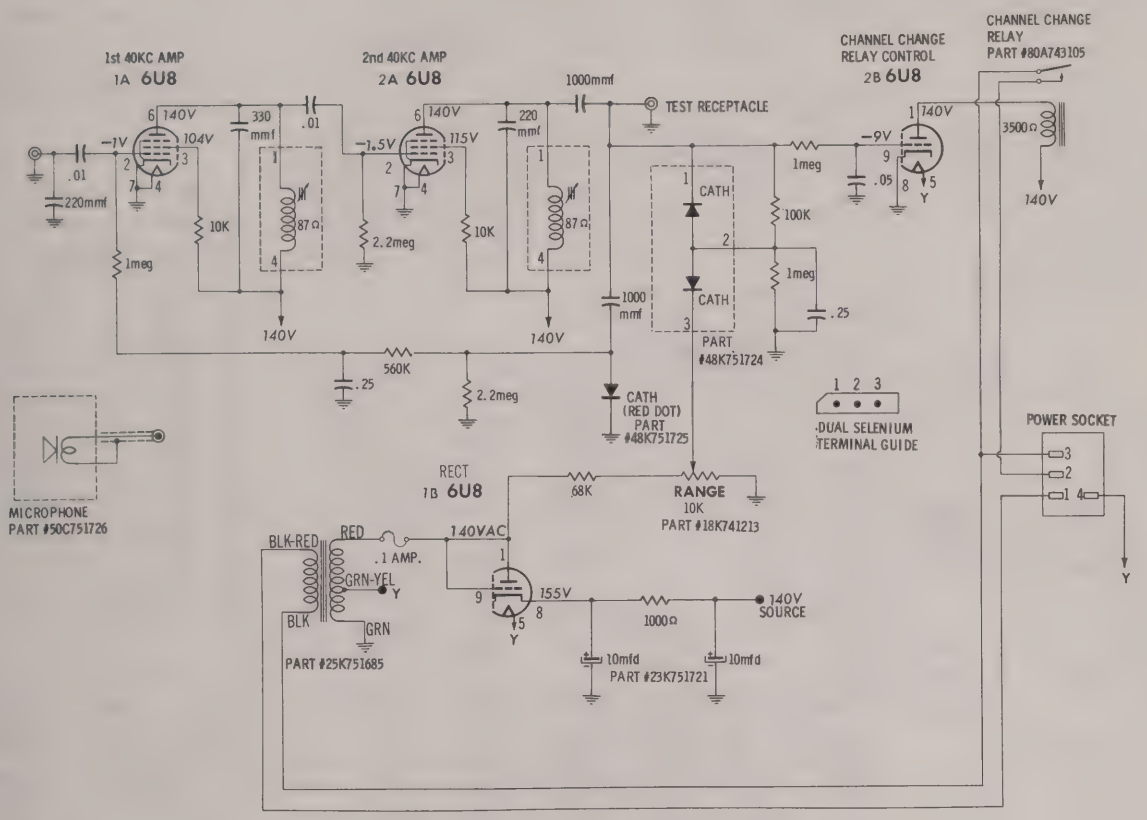
MOTOROLA CHASSIS
TS-561, Y, WTS-561



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS
REMOTE CONTROL TR-5

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		Not used			DC probe to point A . Common to chassis.	Range Control	Adjust for a reading of -12 volts.
2.		Across microphone input	40KC (Unmod)		"	A1, A2	Increase generator output until a decrease is noted in the VTVM reading. Leave generator at this setting. Adjust A1 and A2 for MINIMUM deflection. Final adjustment should be made with sufficient generator signal to produce approximately -4 volts on VTVM.
3.	After receiver has been aligned and replaced in the cabinet, turn Range Control fully counterclockwise, then slowly clockwise until the transmitter will operate the TV within the required operating area. Keep the control at the lowest possible sensitivity.						



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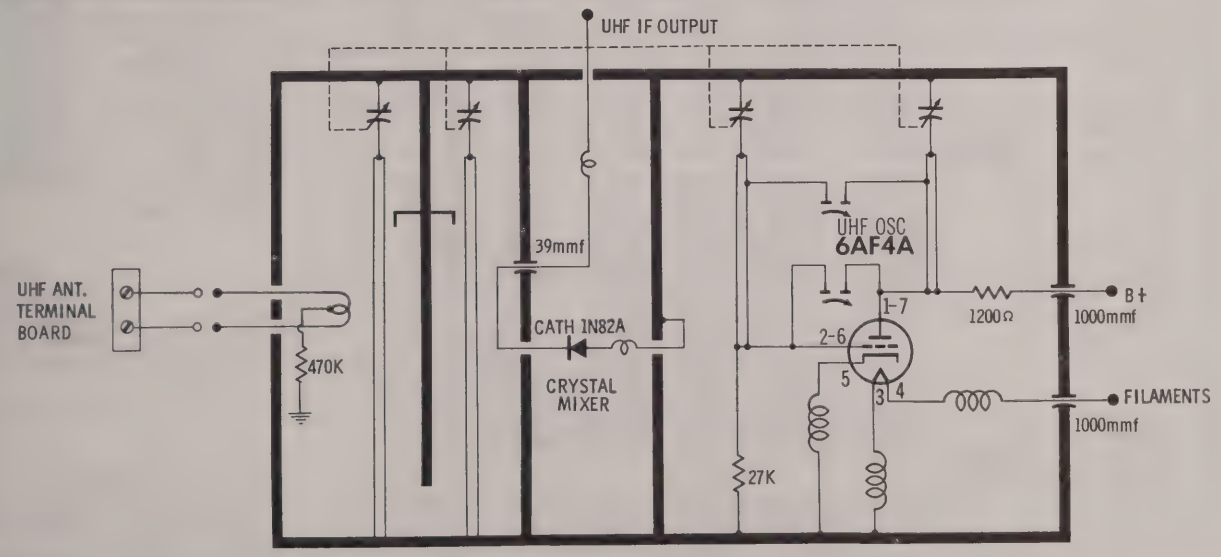
REMOTE CONTROL TR-5



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UHF TUNER TT-111

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.	3BZ6
V2	2nd Video IF Amp.	3BZ6
V3	3rd Video IF Amp.	6EW6
V4	Video Output-Sound IF	6EB8
V5	AGC Keying-Noise Limiter-Sync Sep.	3BU8
V6	Audio Det.	3BN6
V7	Audio Output	6BQ6
V8	Vert. Mult. - Horiz. AFC	6CN7
V9	Vert. Mult. - Vert. Output	6AQ5
V10	Horiz. Mult.	6CQ7
V11	Horiz. Output	6DQ6A
V12	Damper	6AF3
V13	HV Rect.	3A3
V14	LV Rect.	5U4GB

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V18	21CBP4A	21CBP4A ①	21CBP4A ①	21CBP4/ 21CBP4A	21CBP4/ 21CBP4A ②	① Aluminized ② "Silver Screen 65"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	350	23CT47541	AFH4-05-40	D0044	FP430-45	TMQ-143	TVL-4710-2	
B	80	300							
C	40	300							
D	10	300							
C2A	30	300	23CT48732	AFH3-05	BQ620	FP217-05	TMD-71	TVL-2805	
B	20	25							
C3	2	20	23CT33205	PRH2500	BRH2-50	TC303	TD-2-25	TVA-1201	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	FLAMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-D10
C5	470		BPD-00047	DD-471	BYA10T47	CCT-471	B-347	5GA-T47
C6	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-D10
C7	6.8 NPO 5%	(10mmf 5%)*	NPO-DI 6.8	DTZ-6R8	C10Y6R8	CCTO-6R8 **	CNO-668	10TCC-Y6S 10TCF-Q3S
C8	18 N150 10%	#21R130S7S						
C9	.75	#21K735623						
C10	1000		EF-001	MFT-1000		CCF-102		CT2B0A
C11	22 N150 10%					**		10TCP-Q22
C12	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-D10
C13	470		BPD-00047	DD-471	BYA10T47	CCT-471	B-347	5GA-T47
C14	470		BPD-00047	DD-471	BYA10T47	CCT-471	B-347	5GA-T47
C15	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-D10
C16	560	(680mmf) *	DC-560	DD-561	L10T56	CCD-561	B-356	5HK-T56
C17	470		BPD-00047	DD-471	BYA10T47	CCT-471	B-347	5GA-T47
C18	8.8 N150 10%	#21R128194				**		
C19	4.7		NPO-SH 4.7	TCZ-4R7	C10Y4TC	CCTO-4R7	CNO-547	10TCC-V47
C20	4.7		NPO-SH 4.7	TCZ-4R7	C10Y4TC	CCTO-4R7	CNO-547	10TCC-V47
C21	3.9	#21R115853 †			C10Y4C	CCTO-3R9		10TCC-V39
C22	.02 200V 10%		V56C4S3-10%		PM2S3	6DP-2-203	GEM-1613	4TM-S2
C23	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C24	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C25	.1 400V		P458N-1	DF-104	CUB4P1	6DP-3-104	GEM-401	4TM-P1
C26	10000 1400V		DAC-27	DDH-103	HVB15S1	16DP-3-103	2HV-110	BL-S10
C27	5000 2000V			DDH3-503	HVC30D6		2HV-547	BL-D50
C28	20000		BPD-03	DD-303	HYB8S2	CCD-203	B-120	5HK-S2
C29	470 2000V		HVD-20-470	DDH3-471	HVB30T47	VCM-20-47LM	2HV-347	20GA-T47
C30	.35 100V		P388N-35		CUB2P25	1DP-3-354	GEM-2025	2TM-P25
C31	3.7 NPO ± .25mmf		NPO-DI 3.7		C10Y3C			10TCC-V37
C32	.1 400V		P458N-1	DF-104	CUB4P1	6DP-3-104	GEM-401	4TM-P1
C33	3.9	#21R115953						39GA-T39
C34	10 NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-V39
C35	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-V50
C36	4.3		NPO-SH 4.7	TCZ-4R7	C10Y4TC	CCTO-4R7	CNO-447	10TCC-Q47
C37	1000 10%		DE-1000	DD-102	DMB1A	CCD-102	GP210	10TCC-V47
C38	470 10%		1469-00047	DD-471	1R5T47	CM-20B-471K	MCJ244	10TS-D10
C39	100		BPD-001	DD-101	L10T1	CCD-101	GP310	5GA-T10
C40	10000		BPD-01	DD-103	BYA10X	CCD-103	B-310	5HK-S10
C41	1000 10%		DE-1000	DD-102	1R5DI	CCD-102	GP210	10TS-D10
C42	10 9470 10%	#21R129S16				**		
C43	2200†	(3300mmf) †	BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C44	10000 2000V	#21R129750					2HV-110	BL-S10
C45	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-350	5HK-D50
C46	230		DE-230	DD-221	L10T23	CCD-231	B-323	5GA-T22
C47	3000		DE-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C48	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-D10
C49	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-320	5HK-D20
C50	02 600V		P688N-02	DD-203	CUB2S2	6DP-3-203	GEM-612	4TM-S2
C51	30000		BPD-03	DD-303	BYA8S3	CCD-203	B-120	5HK-S20
C52	.05 400V		P468N-05	DD-503	CUB4S5	6DP-3-503	GEM-415	4TM-S5
C53	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-333	5HK-D33
C54	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-333	5HK-D33
C55	.05 1000V		P1088N-05		CUB10S5	16DP-5-503	GEM-1015	10TM-S5
C56	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C57	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C58	05 300V		P388N-05	DD-503	CUB4S5	6DP-3-503	GEM-415	4TM-S5
C59	470 10%		DL-470	DD-471	1R5T47	CCD-471	GP347	10TS-T47
C60	.1 400V		P458N-1	DF-104	CUB4P1	6DP-3-104	GEM-401	4TM-P1
C61	.1 600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	5TM-P1
C62	.1 600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	5TM-P1
C63	220 3000V 10%	#21R125166						
C64	220 3000V 10%	#21R125168						
C65	82 3500V N750 10%	#21R129505						
C66	1000 10%		DE-1000	DD-1000	PM6DI	CCD-102	GP210	10TS-D10
C67	10000 1400V		DAC-27	DDH6-103	CUB16S	16DP-3-103	2HV-110	BL-S10

* Alternate value. ** Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Motorola Part No. † Manufacturer recommends replacement with 3300mmf.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	18K752033				PP26A	Volume
B	Switch		Not Req.				Not Req.	Push-Push Off-On
R2	30K	½	18K753309					Contrast Note 1
	10K Tap							
R3A	1meg	½	18K752021	B-70	A47-1meg-2	Q13-137	U53	Tone, Note 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4	250K	½	18K752019				TA184L *	Brightness
	125K Stop							
R5	2meg	½	18K753030				TA35L	Vert. Hold
R6A	4meg	½	18K743524	AB-S6	A47-4meg-S	B11-240	PTA56L	Vert. Size (Height)
B	Shaft			AK-19	RN-S	T344	Not Req.	
R7A	2meg	½	18K743523	AB-T5	B47-2meg-S	B11-139	PTA26L	Vert. Lin.
B	Shaft			AK-19	Not Req.	T344	Not Req.	
R8A	70K	½	18K748235	AB-S5	A47-75K-S	B11-135	PTA15L	Horiz. Hold
B	Shaft			AK-19	RN-S	T344	Not Req.	
R9A	5000Ω	2(WW)	17B746869	WH-502	A42-5000	WP2-5000	PT5AX	Horiz. Size
B	Shaft			Not Req.	RN-3	Not Req.	Not Req.	
R10	750Ω	2(WW)	18K752964	WH-751 †	B8-700-200 †	WPR-750 †	FL-750 †	Noise Suppressor (Buzz)
	100Ω Stop							

† Use 1000 series resistor.
* Use 100K resistor in series with left hand terminal (viewed from shaft end terminals down).
Note 1. Some versions may use 30K Contrast (Part #18K752016).
Note 2. Some versions may use 1meg Tone (Part #18K752594).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R11	5600Ω 4W	#17K752560	R34	220K		R57	680K	
R12	82000 3W	#17K733283	R35	1000Ω		R58	470K	
R13	1meg		R36	100K		R59	22K	
R14	15meg		R37	33K		R60	1800 1W	
R15	2.2meg		R38	33K		R61	560Ω	
R16	2200Ω		R39	220K		R62	560Ω	
R17	220Ω		R40	47K 4W		R63	470K	
R18	47Ω		R41	100K		R64	470K	
R19	8200Ω		R42	150K		R65	22K	
R20	100K		R43	680Ω		R66	130 1W	#6K127508
R21	220Ω		R44	470Ω		R67	1meg	
R22	120K		R45	390K		R68	120K	
R23	590K		R46	27K 2W		R69	1000Ω	
R24	1000Ω		R47	470Ω 2W		R70	470Ω	
R25	12K 2W		R48	180Ω 1W		R71	68000 2W	
R26	120Ω		R49	10meg		R72	180 2W	#6K127508
R27	47K		R50	470K		R73	330K	
R28	2900Ω		R51	22Ω		R74	8800Ω	
R29	7500Ω 4W	#17K748494	R52	56K		R75	8.2Ω 1W	#6K128098
R30	3300Ω		R53	68K		R76	22K 1W	
R31	15K 2W		R54	68K		R77	470K	
R32	59Ω		R55	1meg				
R33	5900Ω		R56	10K				

Motorola Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	1st Video IF	24K747886						
B	41.25MC Trap							
L2	47.25MC Trap	24K750578	17-4538 ▲	17-4538 ▲	TV-153 ▲	6225 ▲		
L3	47.35MC Trap	24K747585	20-1049	20-1049	TV-153 ▲	6225 ▲		
L4	2nd Video IF	24K747587	17-4522	17-4522	TV-130	6219	VF-3	
L5	3rd Video IF	24K751248	17-4523	17-4523	TV-130	6219	VF-3	
L6	4th Video IF	24K750722						
L7	Resonant Choke	24K119989						8.2uh
L8	Resonant Choke	24K747772						1.8uh ①
L9	Resonant Choke	24K119889						8.2uh
L10	Shunt Peaking Coil	24K749973	19-3375	19-3375	TV-301	6134		390uh
L11	4.5MC Trap	24K753290	20-1004	20-1004	TV-151	1469 ▲	SF-2	
L12	Series Peaking Coil	24K752963 ③	19-3350	19-3350	TV-165	6161	VF-6	340uh
L13	Shunt Peaking Coil	24C749508	19-3300	19-3300	TV-303	6174	VF-8	500uh
L14	Resonant Choke	24R119989						8.2uh
L15	Series Peaking Coil	24K750335	19-3100	19-3100	TV-194	6113		104uh
L16	1st Sound IF	24K753083						
L17	2nd Sound IF	24K752840	17-3496 ▲	17-3496 ▲	TV-113 ▲	6303 ▲	SF-2 ▲	
L18	Quadrature Coil	24D752339					SD-5	
L19	RF Choke	24B747171				4811		
L20	RF Choke	24B747171				4811		
L21	Fil. Choke	24K743675	19-1001	19-1001	BC-562	4804		1.5uh
L22	Fil. Choke	24K743675	19-1001	19-1001	BC-562	4804		1.5uh

▲ Disregard tap.
▲ Remove C38 (470mmf cap.)

① IRC Part #CLA.
② Includes 2700Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L23	40Ω		24K743426	HS-1 *	TV-186 *	6210 *	H-109 *	HS-5 *	Horiz. Stabilizer * Enlarge mounting hole. ▲ Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(.)	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L24	.240A	25Ω	.8hy.	25K751752						C-34X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI	SEC. 1	SEC. 2	SEC. 3	SEC. 4	SEC. 5	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⑤ 1.52A	560VCT ⑥ 240A	5V ⑤ 3A				25K752106						R-75BA
				6.3V ⑤ 8.3A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	25K744974	26873 ①	A-2855	V316 ④	VO38	VO-108	26873 ①	A-133X
T3	Yoke-Horiz. (25MH)	24D743675	Y-45 ③④⑤	MDF-97 ③⑤	MO-8		DY-32A	Y-45 ④⑤⑥	Y-45-2
	(90°)-Vert. (40MH)								
	Rear Cover & Centering Device	59C721145							YC-1
	Yoke Retainer	42A736257							CL-1
	Yoke Clamp	42A736175							
T4	Horiz. Output	24K745397 ⑦							
	Primary Coil	24K745398			MDC-2				D-176
	Secondary Coil	[illegible]				MT-3			

① Drill new mounting hole(s).
② Cut and tape green lead.
③ Remove jumper from yoke terminals #3 and #6.
④ Remove horizontal damping capacitor from yoke terminals #1 and #2 and install across yoke terminals #3 and #7.
⑤ Use original yoke leads, plug, rear cover and core clamp. Connect same as original.
⑥ Remove jumper from yoke terminals #1 and #4.
⑦ Complete assembly.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4600Ω	8-8Ω	25K749230	24864	A-2901	AU-604	A-3337	24864	S-53X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	50K752743 ①	8A12.7	① Models A21K13T, M, Y21K134B, M, W, 21K142B, M, W
	4"	PM	6-8Ω	50K749193 ②		② Models A21T69BG, MG, Y21T66BZ, CS, 21T66BZ, CS

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No	REPLACEMENT DATA
K1	Vert. Sweep Circuit	8000mmf, 10000mmf, 10000mmf, 15000mmf, 50000mmf, 50000 mmf, 8200Ω, 15K, 18K, 18K, 22K, 180K, 220K, 5.6meg.	21K751097	
K2	Horiz. Sweep Circuit	82mmf, 390mmf, 680mmf, 3300 mmf, 5000mmf, 30000mmf, 3900Ω, 8200Ω, 8200Ω, 39K, 56K, 1meg	21C746R2	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MOTOROLA PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M1	3AG	5A 250V	65A743613	21A737466	312005 (3AG 5A 250V	357001	MTH3	4406
M2 M3	1 1/4" Length N	of 4/10 Wire 4/10A 250V S/B	65K750576	21K750575	333.400 (N 4/10A 250V S/B)	346009	N 4/10	HN 3/10 to 1/2

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4		48K747548	1N60	1N295	1N295	Video Det. (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Tuner	11U752774	VHF (OMTT-123) Ch. TS-561
	Tuner	11U752413	VHF (STATT-117) Ch. WTS-561
	Tuner	11U752777	VHF with UHF provisions (OMTT-123Y) Ch. TS-561Y
	Tuner		UHF (TT-111)
M6	Switch	8C746780	Thermal Cutout
	Switch	40B764130	Pushbutton (Channel Selector) Remote Tuning
	Switch	1K752751	Power Channel Rep Selector Remote Tuning
	Motor & Gear Box	1D751824	Assembly Remote Tuning
	Magnet	48B737365	Pincushion Correction

MOTOROLA CHASSIS TS-561, Y, WTS-561

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

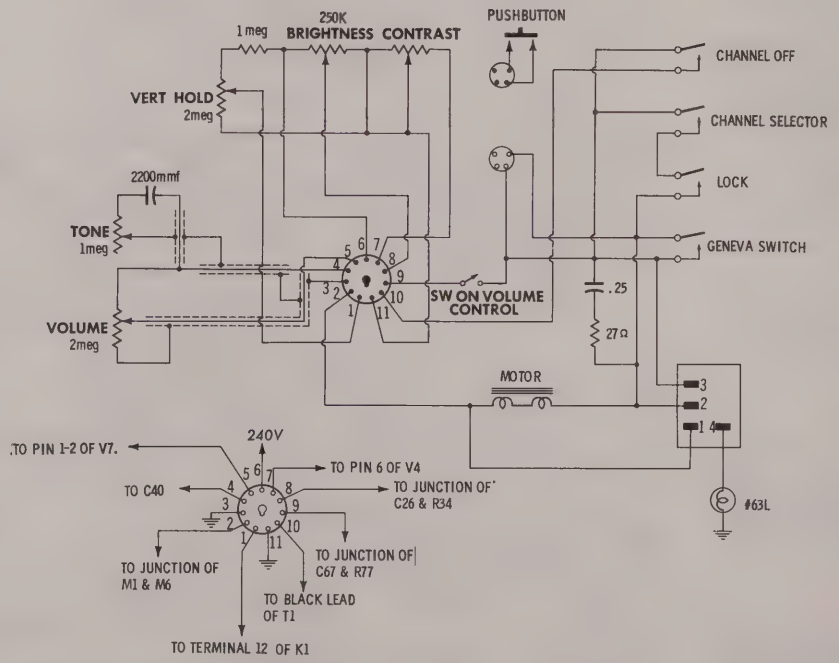
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	61C747252	Tinted, All Models
Mask	13K751505	Models Y21K124B, M, W, 21K124B, M, W
Mask	13K751913	Models A21K137B, M
Mask	13F751413	Models Y21T66BZ, CH, 21T66BZ, CH
Mask	13K751907	Models A21T69BG, MG
Knob	1B751718	VHF Channel Selector, Models Y21K124B, M, W, Y21T66BZ, CH, 21K124B, M, W, 21T66BZ, CH
Knob	36B752870	Channel Selector, Fine Tuning (Pre-set) Models A21K137B, M, A21T69BG, MG
Knob	36K751696	Fine Tuning (Rear) VHF Models Y21K124B, M, W, Y21T66BZ, CH, 21K124B, M, W, 21T66BZ, CH
Knob	1V751931	Fine Tuning (Front) VHF Models Y21K124B, M, W, Y21T66BZ, CH, 21K124B, M, W, 21T66BZ, CH
Knob	1B751730	Fine Tuning, UHF Models Y21K124B, M, W, Y21T66BZ, CH, 21K124B, M, W, 21T66BZ, CH
Knob	1V751924	Off-On Volume
Knob	36B751755	Brightness, Vert. Hold
Knob	36K751697	Contrast
Knob	36K746098	Horiz. Hold
Knob	1V752229	Tone (Includes Bushing) Models A21K137B, M, Y21K124B, M, W, 21K124B, M, W
Knob	36B752588	Tone, Models A21T69B6, MG, Y21T66BZ, CH, 21T66BZ, CH
Dial Scale	34C751731	UHF Models Y21K124B, M, W, Y21T66BZ, CH, 21K124B, M, W
Pushbutton	1V752909	Assembly (Channel Selector) Models A21T69, BG, MG
Cabinet	16K751592	Model 21K124B
Cabinet	16E751590	Model 21K124M
Cabinet	16K751591	Model 21K124W
Cabinet	16K752450	Model A21K137B
Cabinet	16E752449	Model A21K137M
Cabinet	16E751690	Models Y21T66BZ, 21T66BZ
Cabinet	16K751692	Models Y21T66CH, 21T66CH
Cabinet	16K751694	Model A21T69BG
Cabinet	16K751693	Model A21T69MG
Leg	16K748130	Model A21K137B
Leg	16K748131	Model A21K137M

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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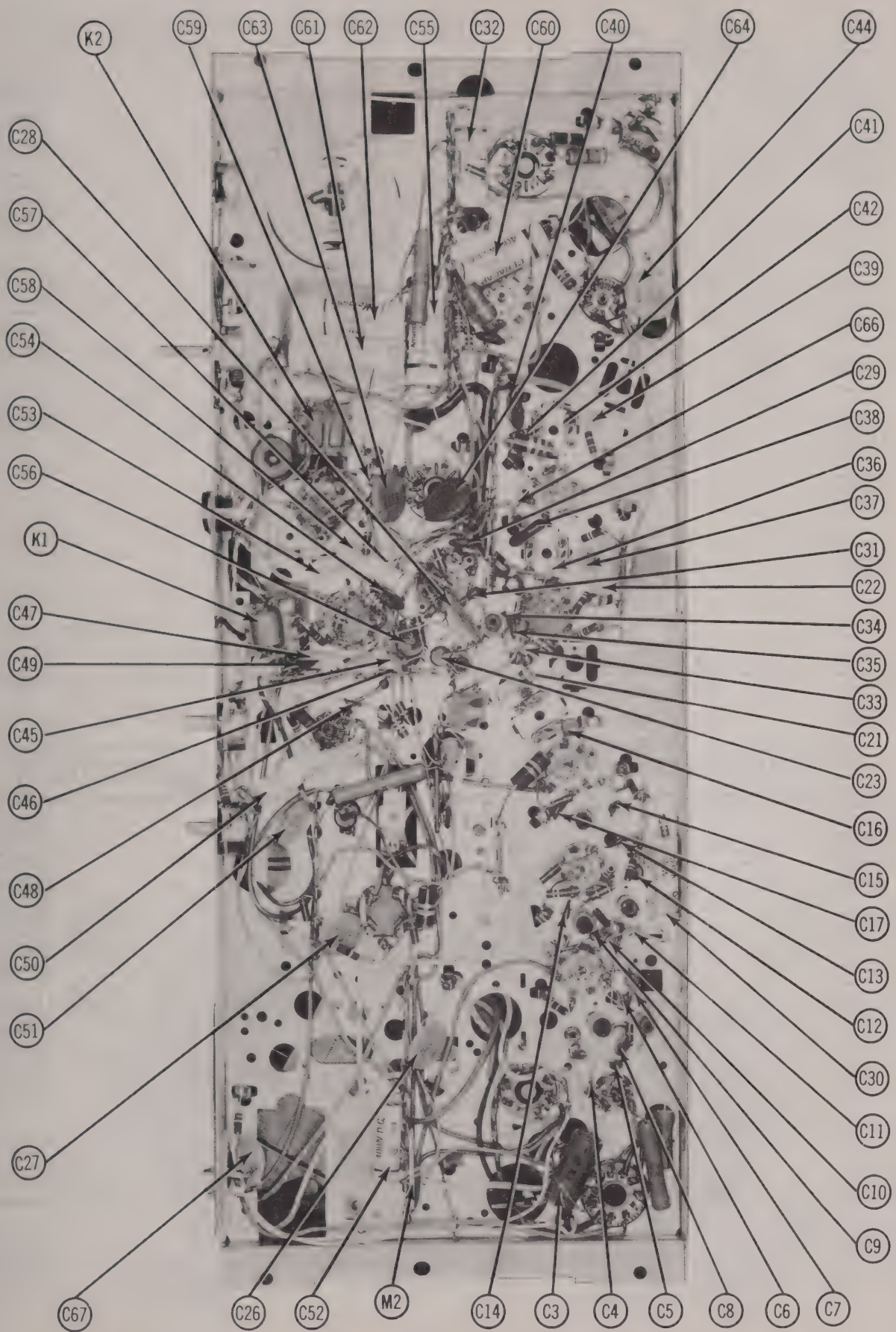
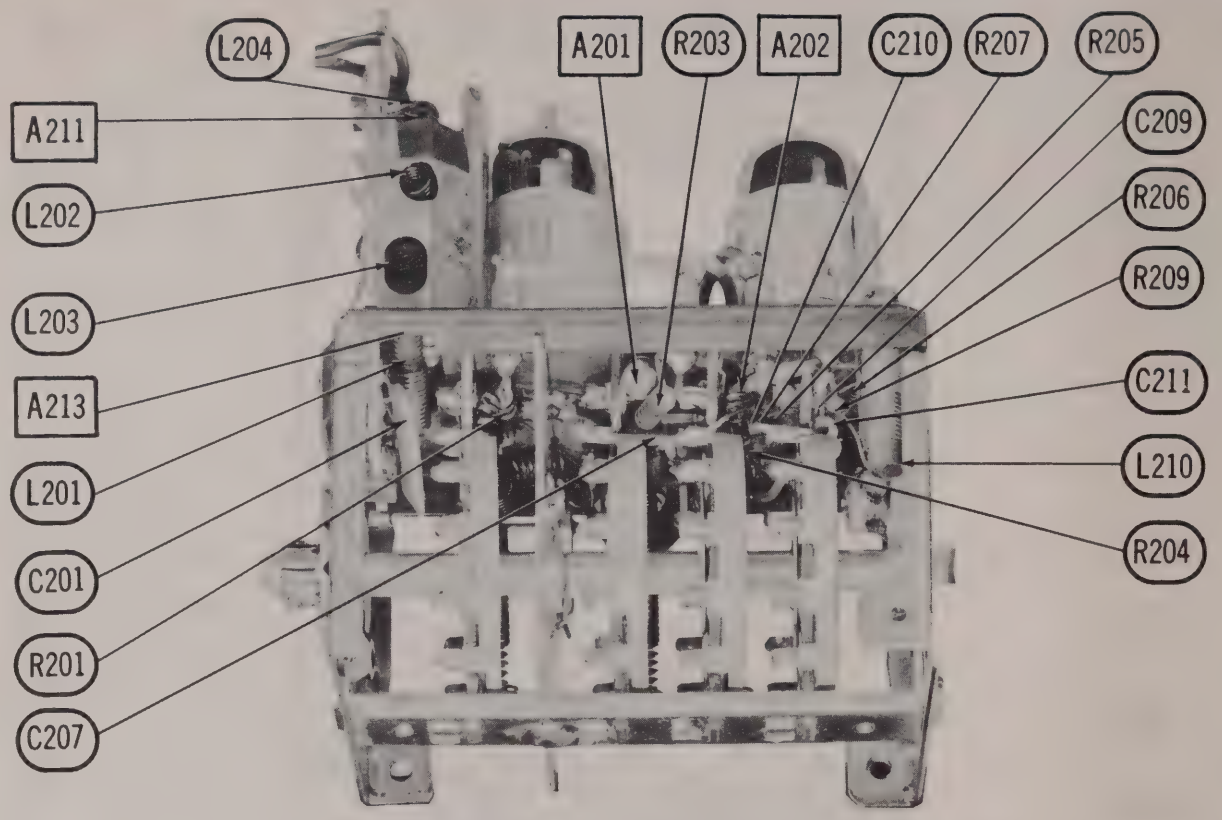
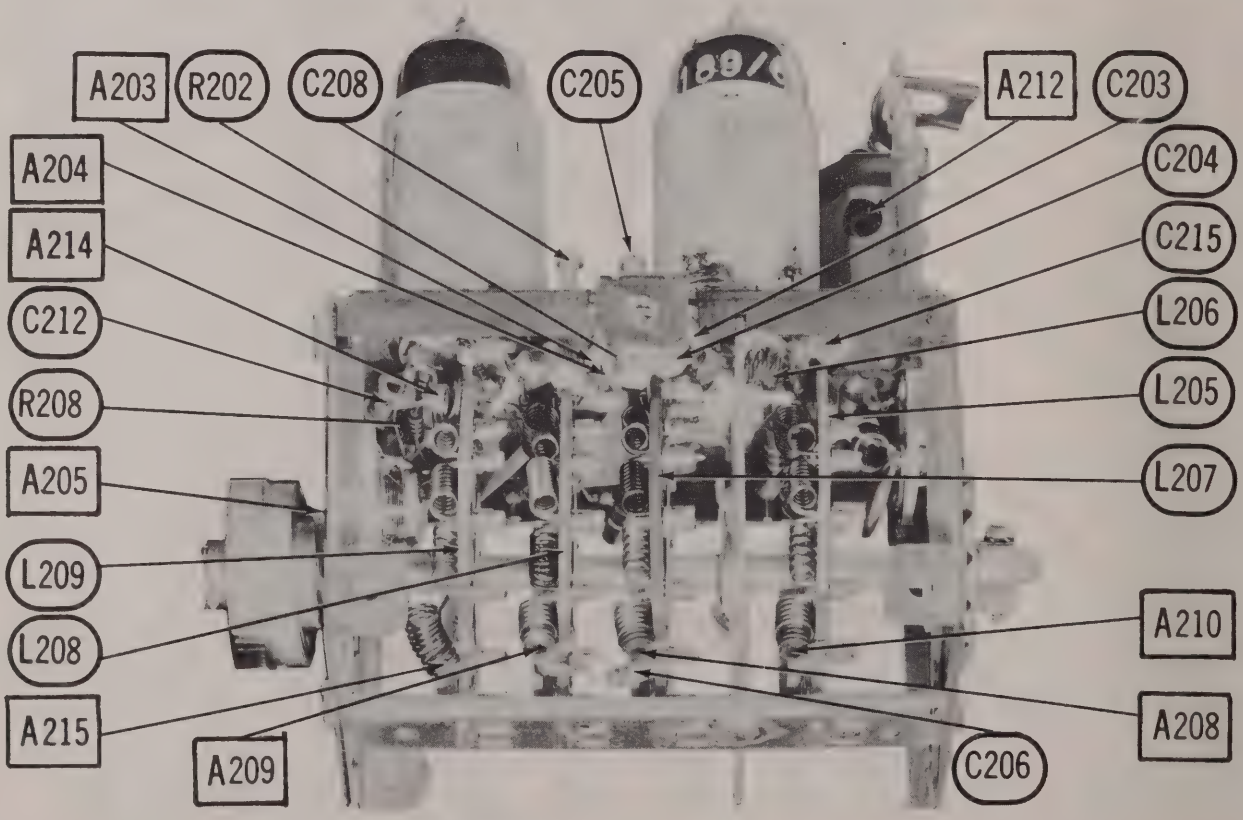
REMOTE WIRING



CHASSIS BOTTOM VIEW - CAPACITOR IDENTIFICATION



TUNER 1U752774 (OMTT-123) - LEFT SIDE



TUNER 1U752774 (OMTT-123) - RIGHT SIDE

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT — 1U752774(OMTT-123)

Remove the UHF Tuner from the side of the VHF Tuner so that UHF input receptacle of VHF Tuner is accessible. Coils are accessible thru opening in the side of tuner.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Fig. 203	High side thru matching network to UHF input receptacle. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	UHF	Vert. Amp. thru 47K to point Ⓤ. Low side to chassis.	A216, A217	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.

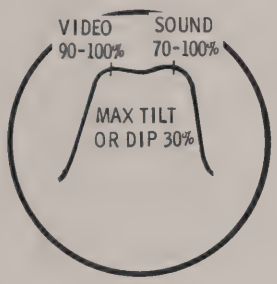


FIG. 201

FIG. 202

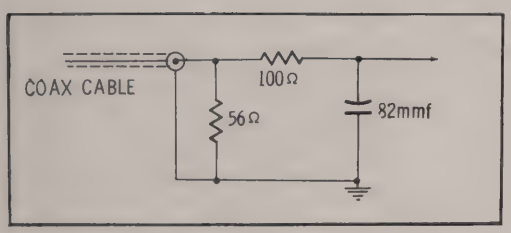
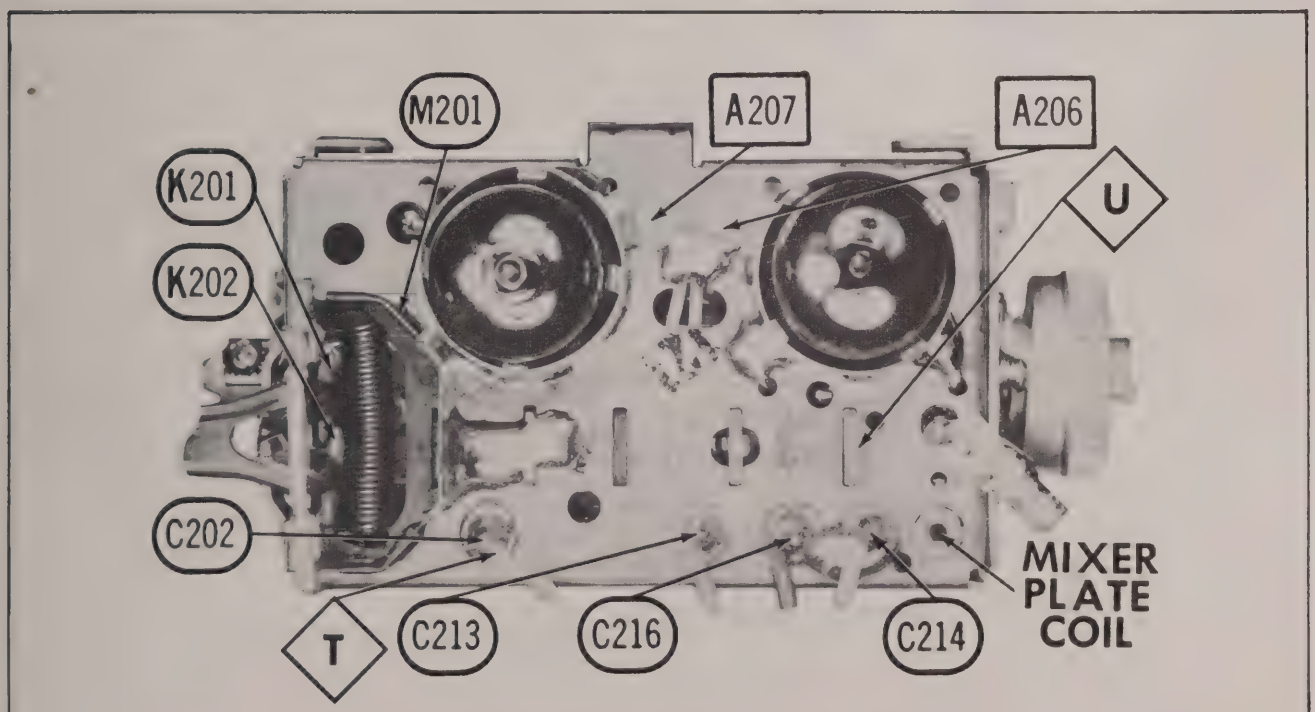


FIG. 203

FIG. 204



TUNER 1U752774(OMTT-123) TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

1U752774(0MTT-123)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6ES8	V202	Mixer-Oscillator	6EU8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201A	27	#51K751641		TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
B	15			TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C	6.8			TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C202	1000		EF-001	MFT-1000		CCF-102	CT280A	
C203	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C204	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C205	.5-3			829-3		CV-1	CT565	
C206	1.5 10%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C207A	132			TCZ-130	L10T13			
B	15	#51K752032		TCZ-15	C10Q15C	CCTO-15	CNO-415	10TCC-Q15
C208	2-6			829.6		CV-3	CT552	
C209	3.9 10%	#21R128917			C10V4C			10TCC-V39
C210	680 10%		DI-680	DD-681		CCS-681	GP368	10TS-T68
C211	15 5%		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C212	5.6 N5250 5%	#21K749376				*		
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	680 10%		DI-680	DD-681		CCS-681	GP368	10TS-T68
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
\# Motorola Part Number.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	1meg	
R203	330Ω	

ITEM No.	RATING	REMARKS
R204	15K	
R205	100K	
R206	33K	

ITEM No.	RATING	REMARKS
R207	47K	
R208	15K	
R209	2200Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K201	40MC Filter	10mmf, 22mmf, 470K	51C747535	
K202	40MC Filter	10mmf, 22mmf, 470K	51C747535	

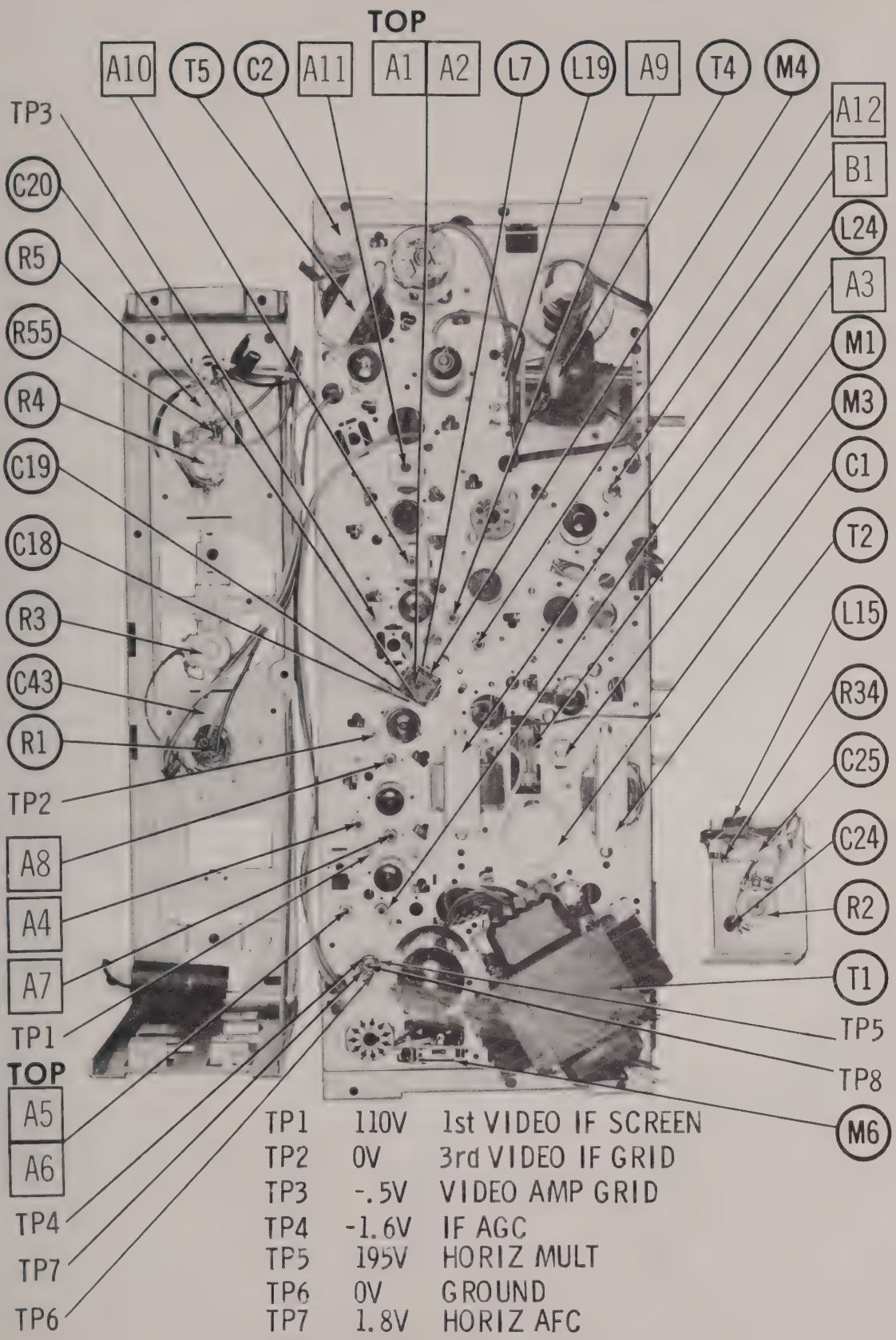
COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	IF Trap Coil	24K751655 †	† Part of M201.
L202	IF Trap Coil	24K751655 †	
L203	Ant. Trans.	24B749398 †	
L204	FM Trap Coil	24K752270 †	
L205	Ant. Coils	1V752397	Channels 2-13 Includes Wafer Assy.
L206	RF Choke	24K752261	

ITEM No.	USE	MOTOROLA PART No.	NOTES
L207	RF Coils	1V751663	Channels 2-13 Includes Wafer Assy.
L208	Mixer Grid Coils	1V751662	Channel 2-13 Includes Wafer Assy.
L209	Osc. Coils	1V748991	Channel 2-13 Includes Wafer Assy.
L210	Mixer Plate Coil	24B747838	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Hi Pass Filter	1V751664	Assembly
	Shaft	1B752100	Fine Tuning, Includes Driver Gear
	Shaft	47K752075	VHF Channel Selector
	Idler Gears & Shaft	1A752394	Assembly



TP1	110V	1st VIDEO IF SCREEN
TP2	0V	3rd VIDEO IF GRID
TP3	-.5V	VIDEO AMP GRID
TP4	-1.6V	IF AGC
TP5	195V	HORIZ MULT
TP6	0V	GROUND
TP7	1.8V	HORIZ AFC
TP8	240V	B+

CHASSIS - TOP VIEW

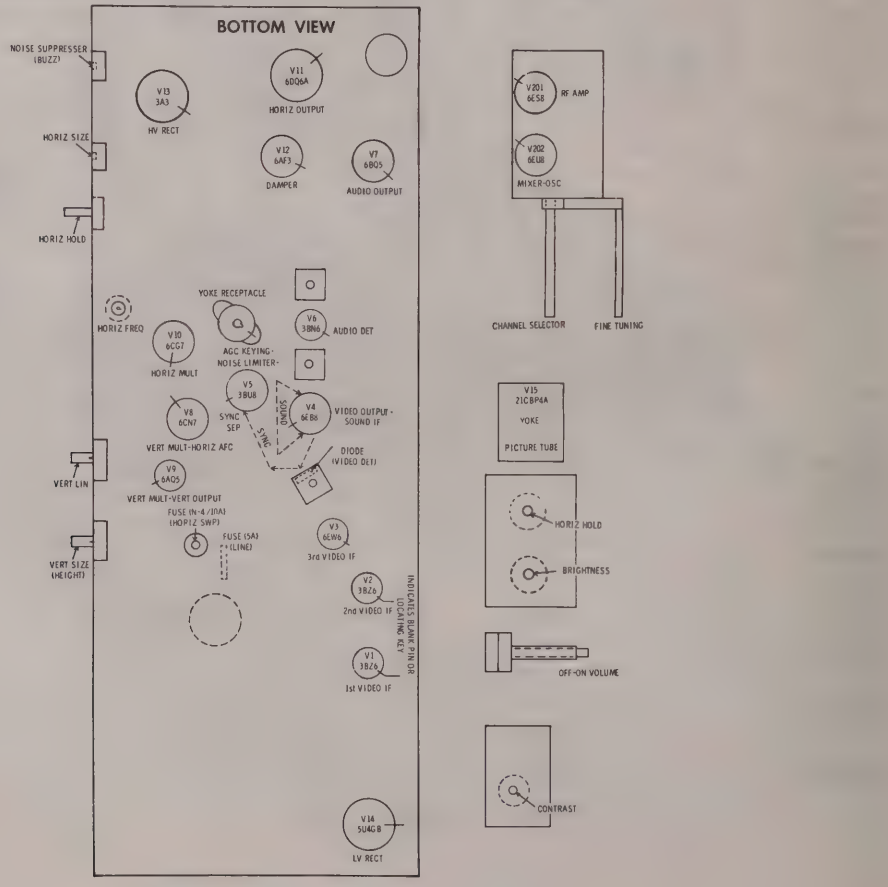
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	680K	47Ω	.1Ω	.5Ω	▲ 220Ω	▲220Ω	0Ω		
V2	3BZ6	80K	INF	0Ω	.5Ω	†220Ω	†220Ω	80K		
V3	6EW6	1000Ω	120Ω	.1Ω	0Ω	†12K	†12K	0Ω		
V4	6EB8	0Ω	100K	†150K	.1Ω	0Ω	39Ω	3900Ω	†15K	†6500Ω
V5	3BU8	†3900Ω	ŧ47K	2.9meg	.1Ω	.5Ω	†40K	† 270K	ŧ100K	ŧ10meg
V6	3BN6	● 470Ω	.2Ω	.5Ω	0Ω	†27K	5.7Ω	†390K		
V7	6BQ5	0Ω	0Ω	180Ω	.1Ω	0Ω	NC	†1000Ω	NC	†470Ω
V8	6CN7	22K	960K	490K	.1Ω	0Ω	0Ω	●1.5meg	● †2.2meg	0Ω
V9	6AQ5	● 1.5meg	0Ω	0Ω	.1Ω	†610Ω	†150Ω	●1.5meg		
V10	6CG7	†60K	● 65K	1000Ω	.1Ω	0Ω	†12K	1.9meg	1000Ω	NC
V11	6DQ6A	TP	0Ω	NC	● †10K	1meg	NC	.1Ω	12Ω	TOP CAP †12Ω
V12	6AF3	NC	†2.5Ω	NC	0Ω	.1Ω	NC	TP	NC	†2.5Ω
V13	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †260Ω
V14	5U4GB	TP	¶	NC	22Ω	NC	23Ω	NC	¶	
V15	21CBP4A	0Ω	100K	Pin 6 †33K	Pin 10 †33K	Pin 11 260K	Pin 12 .1Ω			
V201	6ES8	†5900Ω	1.2meg	INF	0Ω	.1Ω	INF	3meg	0Ω	0Ω
V202	6EU8	†8200Ω	†15K	†10K	0Ω	.1Ω	0Ω	100K	0Ω	†55K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

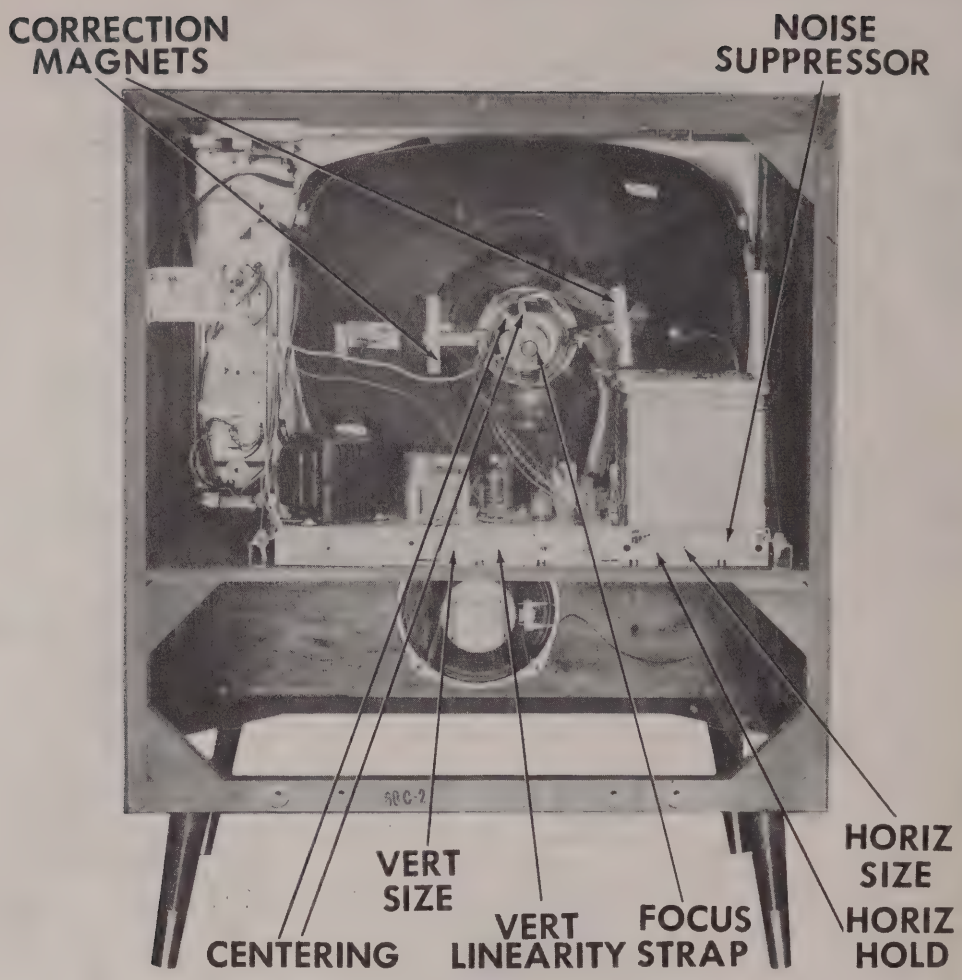
TOP CAP ¶5meg

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 240V SOURCE.
▲ MEASURED FROM PIN 2 OF V2.
ŧ MEASURED FROM TOP CAP OF V12.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-7 and chassis. Adjust the Horizontal Hold control until the picture is synchronized horizontally.

Adjust the Horizontal Size (R9) for a picture slightly wider than necessary to fill the picture mask horizontally.

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-7 to chassis. Connect .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust Horizontal Hold to the point where the picture is almost stable horizontally.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 21K124M

1. Remove 7 wood and 1 metal screws holding rear cover. Remove 1 push-on type knob from rear of cabinet. Remove antenna leads. Remove rear cover.
2. Remove tuner cable plugs, front control cable plug, speaker leads, yoke plug, HV lead and picture tube socket.
3. Remove 2 wood screws holding Contrast control.
4. Remove 4 chassis bolts holding chassis to metal frame.
5. Remove chassis.

FRONT CONTROL PANEL REMOVAL

1. Remove 6 push-on type knobs from front of cabinet.
2. Turn the Brightness-Vertical Hold control bracket one-half turn counterclockwise from rear of cabinet.
3. Remove 3 metal screws holding front control bracket (2 at bottom, and 1 at top).
4. Pull out control panel at bottom until Brightness-Vertical Hold control knobs are clear of openings. Slide out of flange at top-left corner and remove.

PICTURE TUBE REMOVAL

1. Remove chassis.
2. Remove 4 bolts holding picture tube-chassis mounting frame.
3. Remove picture tube and frame.
4. Loosen 2 picture tube mounting strap bolts.
5. Remove picture tube.

PHOTOFACT* Folder

EIA

PRODUCTION CHANGE BULLETIN 231

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 434

SYLVANIA MODELS 17P110Q, QU, S, SU, 17P206 SERIES, 21T121 SERIES(CH. 1-537-5, -6, 1-539-3, -4)

Sylvania Models 17P110Q, QU, S, SU, 17P206 Series, 21T121 Series (Ch. 1-537-5, -6, 1-539-3, -4) were covered in PHOTOFACT Folder 2 - Set 434.

The following is a list of changes made during late production.

Ch. 1-537-5, -6 Code 01	TO IMPROVE SYNC CIRCUIT R20 is decreased from 1000Ω to 470Ω. R21 is increased from 470Ω to 2200Ω. R40 is omitted. C32 is decreased from .047mfd to .01mfd. The line that connected R40 and C32 is removed. C32 is now connected to the junction of R20 and R21.
Ch. 1-537-5, -6 Code 03	TO INCREASE LIFE OF VERTICAL OUTPUT TUBE R50 is decreased from 1.2meg to 820K. R54 is increased from 150Ω 2watt to 270Ω 2watt.
Ch. 1-537-5, -6 Code 05	COMPONENT CHANGE R53 is decreased from 18K to 15K.
Ch. 1-537-5, -6 Code 06	COMPONENT CHANGE R35 is increased from 15K to 56K.
Ch. 1-537-5, -6 Code 07	COMPONENT ADDED A .5Ω (Resistor-Coil Combination) is added between pin 7 of V13 (1B3) and R75.
Ch. 1-537-5, -6 Code 08	COMPONENT CHANGE R50 is increased from 820K to 1 meg.

PRODUCTION CHANGE BULLETIN 231

PRODUCTION CHANGE BULLETIN 231

xxxxxx CORRECTION NOTICE xxxxxx

MOTOROLA CHASSIS LTS-430, TS-430, Y

Motorola Models Y17P5-1, -2, Y17T32BZ, 17P5-1, -2, 17T32BZ, 17T33B, M (Ch. LTS-430, TS-430, TS-430Y) were covered in PHOTOFACT Folder 1 - Set 445.

A correction should be made on the test receptacle on page 2 of Folder 1 Set 445. TP-7 should come off pin 4 of the receptacle instead of pin 5. TP-8 should then be placed on pin 5.

SET 468 FOLDER 3

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 360

EMERSON MODELS 1220, 1221 (CH. 120325E, 120326R)

Emerson Models 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM) were covered in PHOTOFACT Folder 4 - Set 360.

Models 1220, 1221 (Ch. 120325E, 120326R) are electrically identical except for the following changes.

COMPONENT CHANGES

R31 is increased from 4700Ω to 8200Ω.

REVISED VIDEO IF

A two stage printed circuit IF board is used instead of the conventionally wired three stage IF. A partial schematic of the new IF board is given in this bulletin on the reverse side.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 457

CONTINENTIAL MODEL TR-150 (Revised)

Continental Model TR-150 was covered in PHOTOFACT Folder 6 - Set 457.

Model TR-150 (Revised) is electrically identical except for the following changes.

COMPONENT CHANGE

R8 is increased from 560Ω to 1000Ω.

R12 is decreased from 8200Ω to 7500Ω.

C6 is increased from .01mfd to .02mfd.

X1 is changed from a type HJ23D to a type 2N219.

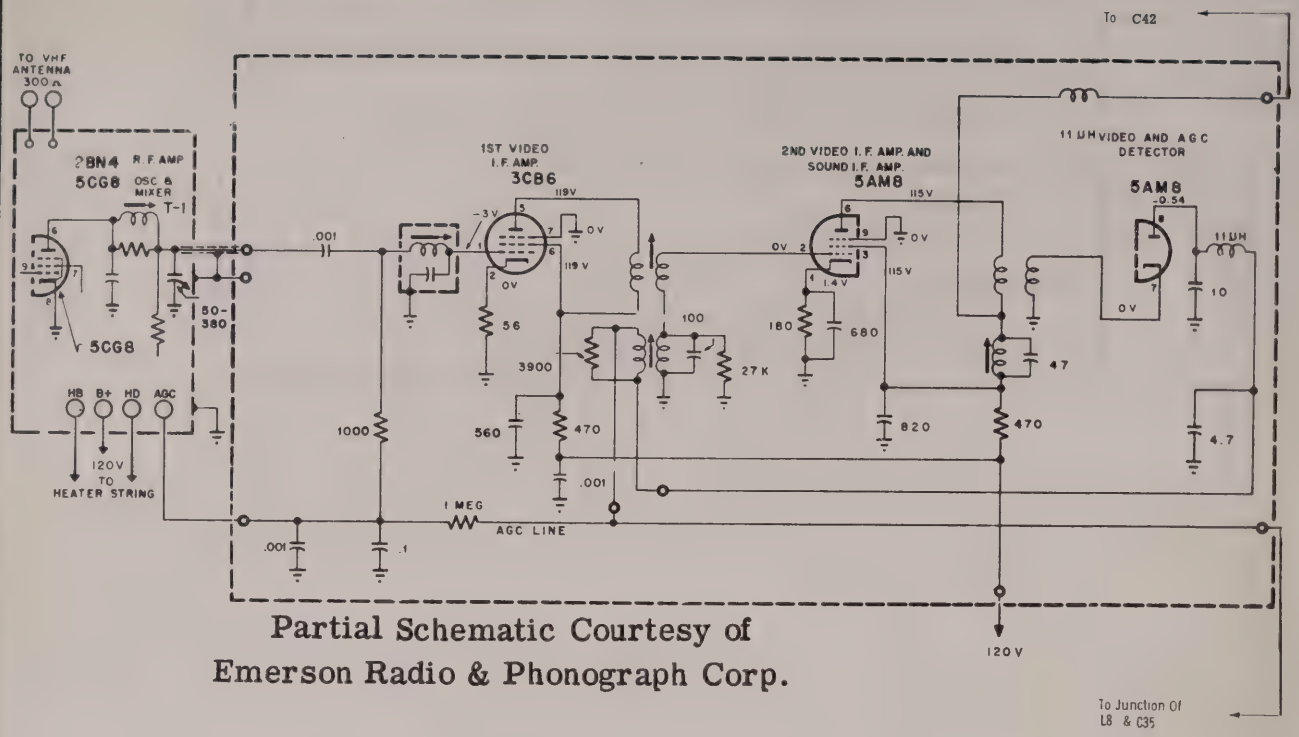
X2 is changed from a type HJ22D to a type 2N218.

X3 is changed from a type HJ15 to a type 2N215.

X4 is changed from a type HJ17D to a type 2N217.

COMPONENT ADDED

A 47K resistor is added between the base and collector of the Output Transistor (X4).



Partial Schematic Courtesy of
Emerson Radio & Phonograph Corp.

PHOTOFACT* Folder

BOGEN MODEL AM91

BOGEN MODEL
AM91

TRADE NAME	Bogen Model AM91
MANUFACTURER	Bogen-Presto Co., A Div. of the Siegler Corp., P.O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 6 Tube AM Tuner
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	26 Watts, .28 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	520 - 1650KC

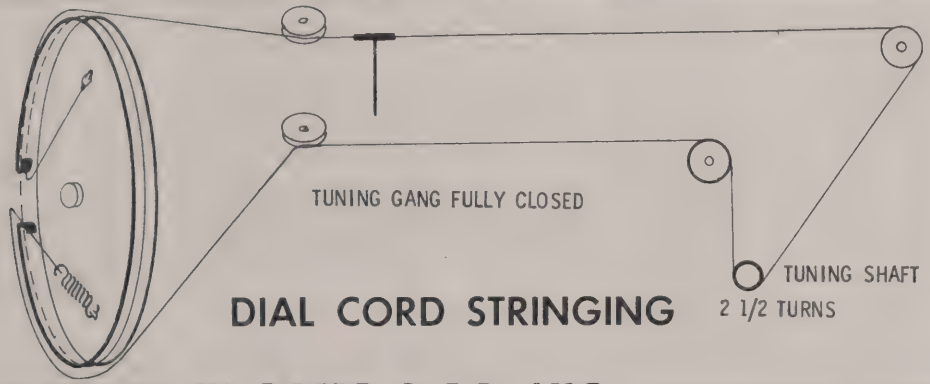
ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set selector to Wide Band Position.

Suggested Alignment Tools:
A1 thru A4, A10 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A7, A8, A9 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (20KC Swp.)	Not used	Tuning gang fully open	Vert. Amp. thru 10K to point A. Low side to chassis.	A1, A2, A3, A4	Adjust for symmetrical flat-top response of maximum amplitude.
2.	High side to antenna terminal. Low side to chassis.	600KC (20KC Swp.)	Not used	600KC	"	A5, A6	"
3.	"	1500KC	Not used	1500KC	"	A7, A8, A9	Adjust for symmetrical flat-top response of maximum amplitude. Repeat steps 2 & 3.
4.	High side to point (A). Low side to chassis.	Not used	10KC	Point of non-interference	Use VTVM. AC probe to output jack. Common to chassis.	A10	Adjust for MINIMUM deflection.



DIAL CORD STRINGING

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JH413

SET 468 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE
V1	RF Amplifier	6BA6
V2	Converter	6BE6
V3	IF Amplifier	6BA6

ITEM No.	USE	TYPE
V4	Det. - AVC - Cath. Foll.	ECC81/12AT7
V5	Tuning Indicator	EM84 (EM840) *
V6	Rectifier	6X4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■10	250	C-543	AFH3-18	C0140	FP23L3 TC47	TMT-18	TVL-3639.8	
B	▲20	250							
C	30	250							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1.2 10%							10TCC-V12
C3	15 N750 10%		N750-DI 15	DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C4	1000 10%		DI-1000	DD-102	1R5D1	CCS-102	JL-210	10TS-D10
C5	22 10%		DI-22	DD-220	L10Q22	CCD-220	CNO-422	10TS-Q22
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C8	.047 200V		P288N-047	DF-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C9	6.8 NPO 10%		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-Q68
C10	1.8 10%							10TCC-V18
C11	47 10%		DI-47	DD-470	L10Q47	CCD-470	CNO-447	10TS-Q47
C12	15 N750 10%		N750-DI 15	DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	4700 10%		DI-4700		1R5D47	CCS-472	JL-247	10TS-D47
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	4700 10%		DI-4700		1R5D47	CCS-472	JL-247	10TS-D47
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	4700 10%		DI-4700		1R5D47	CCS-472	JL-247	10TS-D47
C21	1200 10%		DI-1200	DD-122	1R5D12	CCS-122	JL-212	10TS-D12
C22	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C23	.047 200V		P288N-047	DF-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

RESISTORS

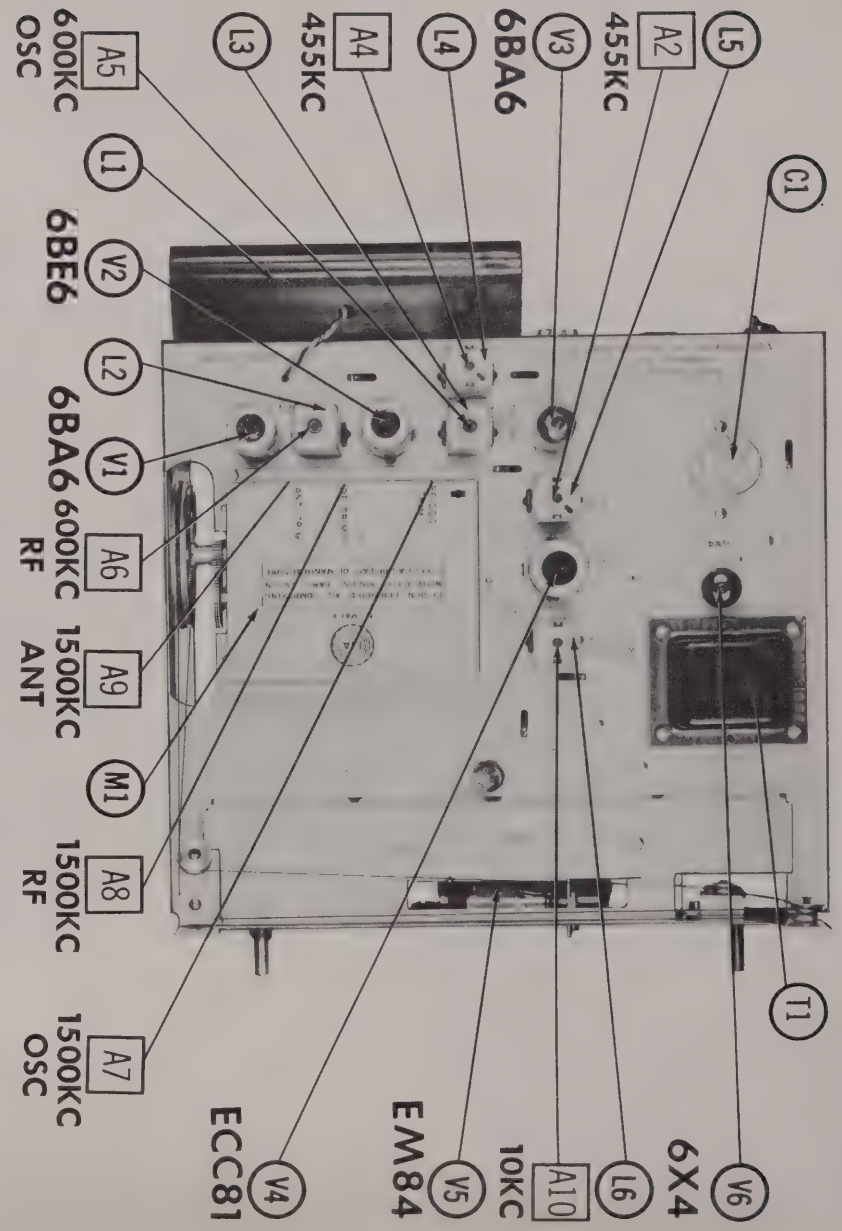
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	1meg	
R2	1200Ω	
R3	3.3meg	
R4	22K	
R5	1500Ω	
R6	220Ω	
R7	330Ω	
R8	100Ω	

ITEM No.	RATING	REMARKS
R9	3.3meg	
R10	330K	
R11	100K	
R12	470K	
R13	1000Ω	
R14	1000Ω	
R15	10K	
R16	10K	

ITEM No.	RATING	REMARKS
R17	1meg	
R18	2.2meg	
R19	470K	
R20	1000Ω 7W	
R21	1500Ω 7W	
R22	68Ω	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		BOGEN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	H668						
L2	RF Trans	H469	14-1410	14-1410				
L3	Osc. Coil	H454	14-1412	14-1412				
L4	Input IF	H368						
L5	Output IF	H368						
L6	10KC Filter	H627						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .28A	430VCT @ .035A	6.3V @ 2.1A	83-511-000						

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BOGEN PART No.	REPLACEMENT DATA
K1	Detector RF Filter	100mmf, 100mmf, 47K	C325	Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1

MISCELLANEOUS

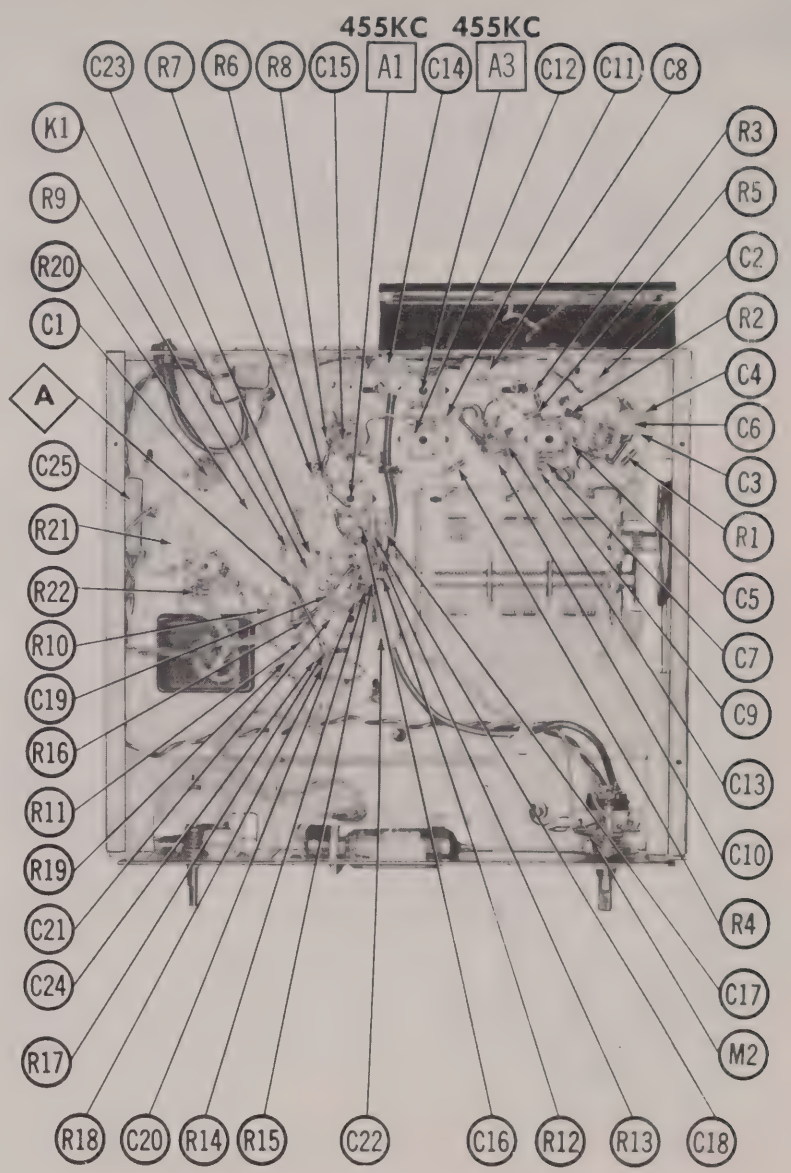
ITEM No.	PART NAME	BOGEN PART No.	NOTES
M1	Tuning Cap.	C653	3 Gang (Ant. 20-542mmf, RF 20-542mmf, Osc. 22-195mmf)
M2	Switch	S535	Off-AM Narrow Band-AM Wide Band

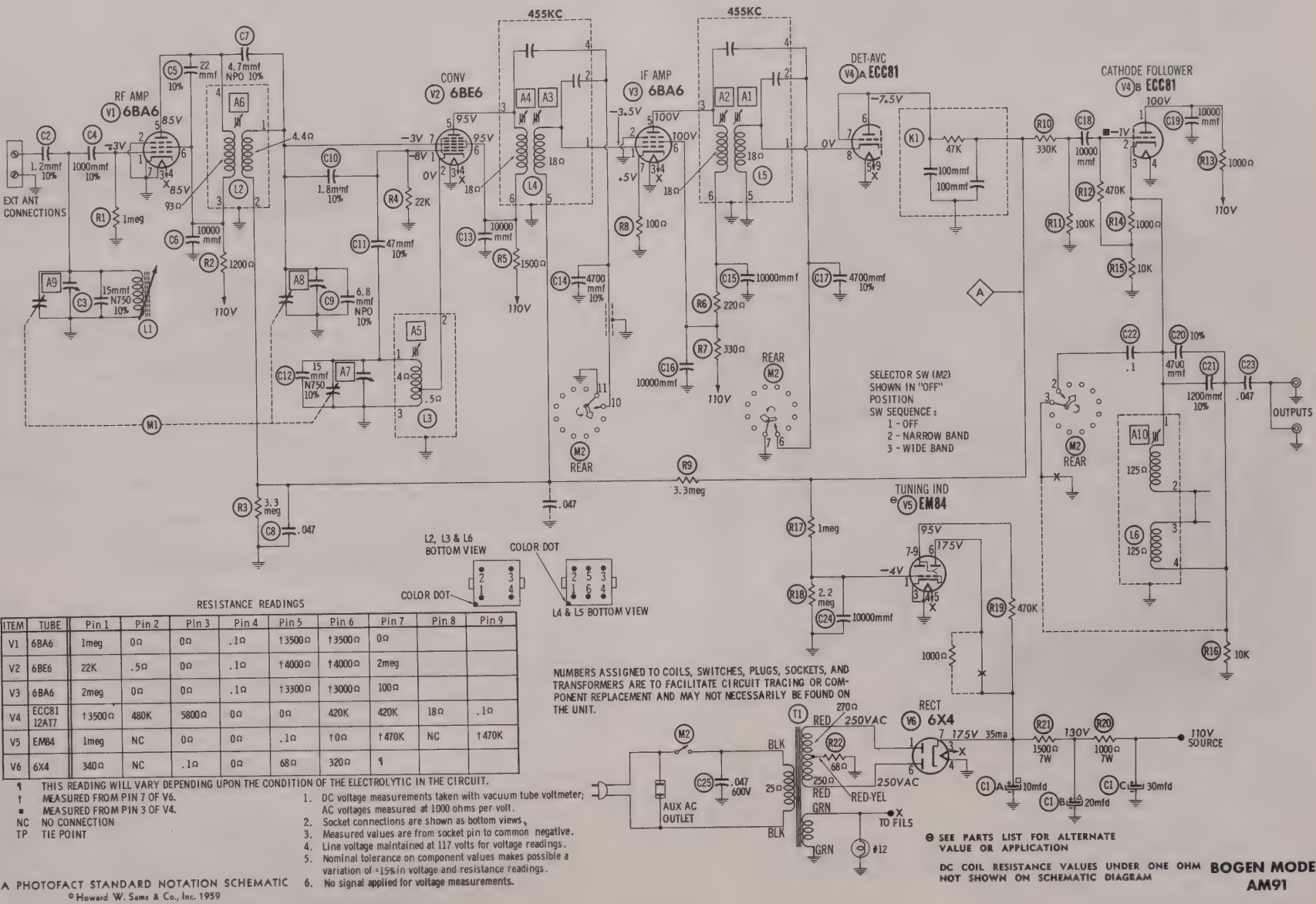
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	1meg	0Ω	0Ω	.1Ω	†3500Ω	†3500Ω	0Ω		
V2	6BE6	22K	.5Ω	0Ω	.1Ω	†4000Ω	†4000Ω	2meg		
V3	6BA6	2meg	0Ω	0Ω	.1Ω	†3300Ω	†3000Ω	100Ω		
V4	ECC81 12AT7	†3500Ω	480K	5800Ω	0Ω	0Ω	420K	420K	18Ω	.1Ω
V5	EM84	1meg	NC	0Ω	0Ω	.1Ω	†0Ω	†470K	NC	†470K
V6	6X4	340Ω	NC	.1Ω	0Ω	68Ω	320Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
■ MEASURED FROM PIN 3 OF V4.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. No signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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BOGEN MODEL AM91

PHOTOFACT* Folder with CIRCUITRACE*

**DELMONICO
MODEL TRS-6**

DELMONICO
MODEL TRS-6

DELMONICO
MODEL TRS-6

TRADE NAME	Delmonico Model TRS-6
IMPORTER	Delmonico International Corp., 42-24 Orchard Street, Long Island City 1, N. Y.
TYPE SET	Battery Operated Transistorized AM Portable Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535KC — 1605KC
RATING	5.9MA @ 9 Volts DC (No Signal, Min. Volume) 8.5MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

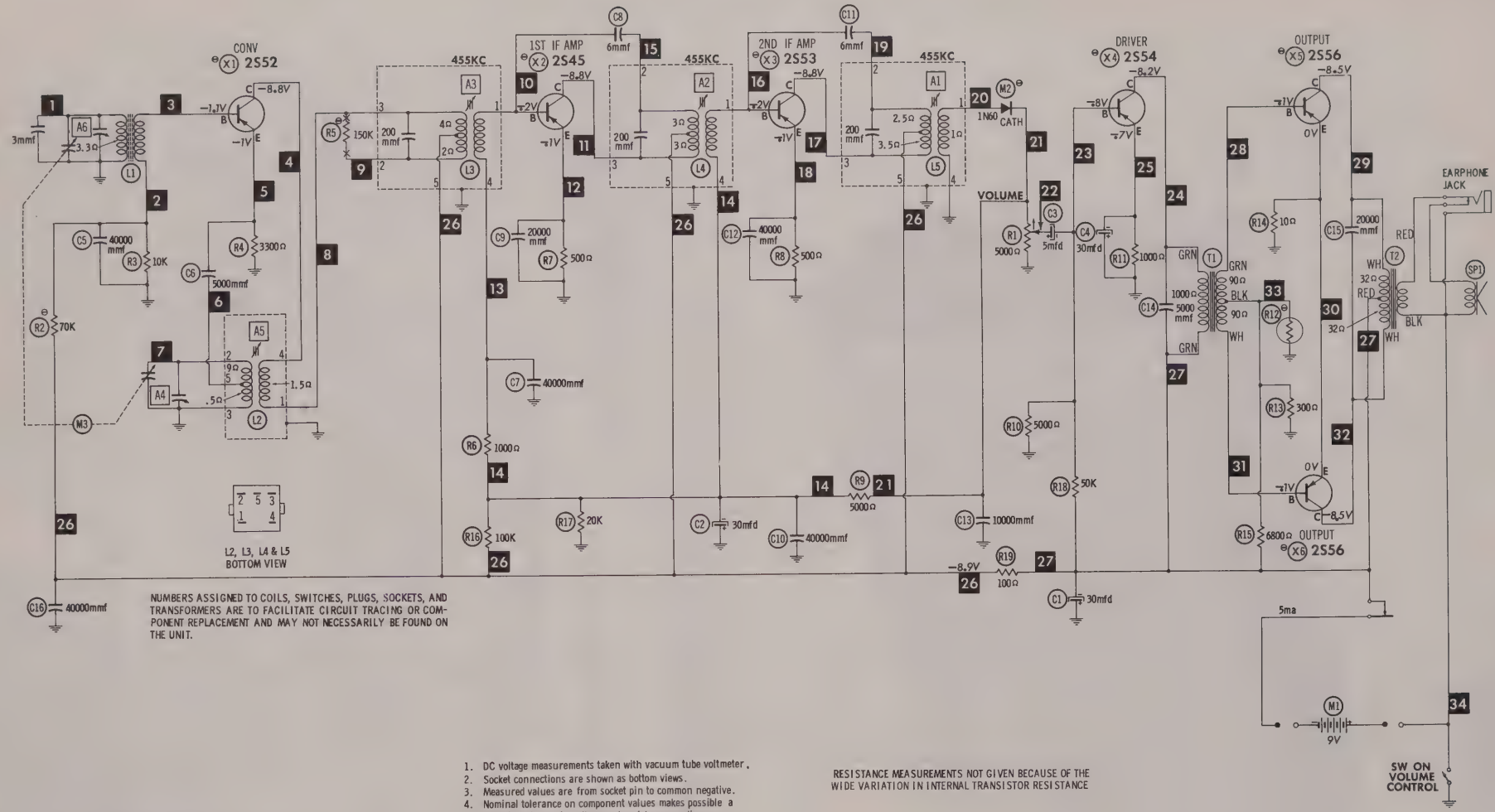
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A4, A6..... GENERAL CEMENT #9087, 9089
WALSCO #2528

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1605KC	"	"	A4	"
3.		"	600KC	600KC	"	A5	"
4.		"	1400KC	1400KC	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein: © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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DELMONICO MODEL TRS-6

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52①	Converter		2N411	2N486		PNP
X2	2S45②	1st IF Amplifier		2N409	2N483		PNP
X3	2S53②	2nd IF Amplifier		2N409	2N482		PNP
X4	2S54③	Driver		2N407	2N362		PNP
X5	2S56④	Output		2N407	2N633		PNP
X6	2S56④	Output		2N407	2N633		PNP

① Alternate HJ23D ② Alternate HJ22D ③ Alternate HJ15 ④ Alternate HJ17

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Delmonico PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	10		XPP-10030	NLW30-15	TT15X30	ML30-15	TE-1158	
C2	30	6		XPP-6030	EC30-6	TT6X30	ML30-6	TE-1092	
C3	5	6		XPP-6005	EC5-6	TT6X5	ML5-6	TE-1084	
C4	30	6		XPP-6030	EC30-6	TT6X30	ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	40000		C-80V503AM	DA-503	H-05S5		TA-150	TG-S50
C6	5000		C-80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D5
C7	40000		C-80V503AM	DA-503	H-05S5		TA-150	TG-S50
C8	6			DD-060	C10V6C			5GA-V6
C9	20000		C-80V203AM	DA-203	H-05S2		TA-120	TG-S20
C10	40000		C-80V503AM	DA-503	H-05S5		TA-150	TG-S50
C11	6			DD-060	C10V6C			5GA-V6
C12	40000		C-80V503AM	DA-503	H-05S5		TA-150	TG-S50
C13	10000		C-80V103AM	DM-103	H-05S1	CCD-103	TA-110	TG-S10
C14	5000		C-80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D5
C15	20000		C-80V203AM	DA-203	H-05S2		TA-120	TG-S20
C16	40000		C-80V503AM	DA-503	H-05S5		TA-150	TG-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Delmonico PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	33.10	B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Delmonico PART No.	NOTES
	OHMS	WATT		
R2	70K			Note 1
R3	10K			
R4	3300Ω			
R5	150K			Note 2
R6	1000Ω			
R7	500Ω			
R8	500Ω			
R9	5000Ω			
R10	5000Ω			

Note 1. A 150K is used in some versions.
Note 2. Not used in some versions.

ITEM No.	RATING		Delmonico PART No.	NOTES
	OHMS	WATT		
R11	1000Ω			
R12				Note 3
R13	300Ω			
R14	10Ω			
R15	6800Ω			
R16	100K			
R17	20K			
R18	50K			
R19	100Ω			

Note 3. Temperature Compensating Unit.

PRINTED BOARD

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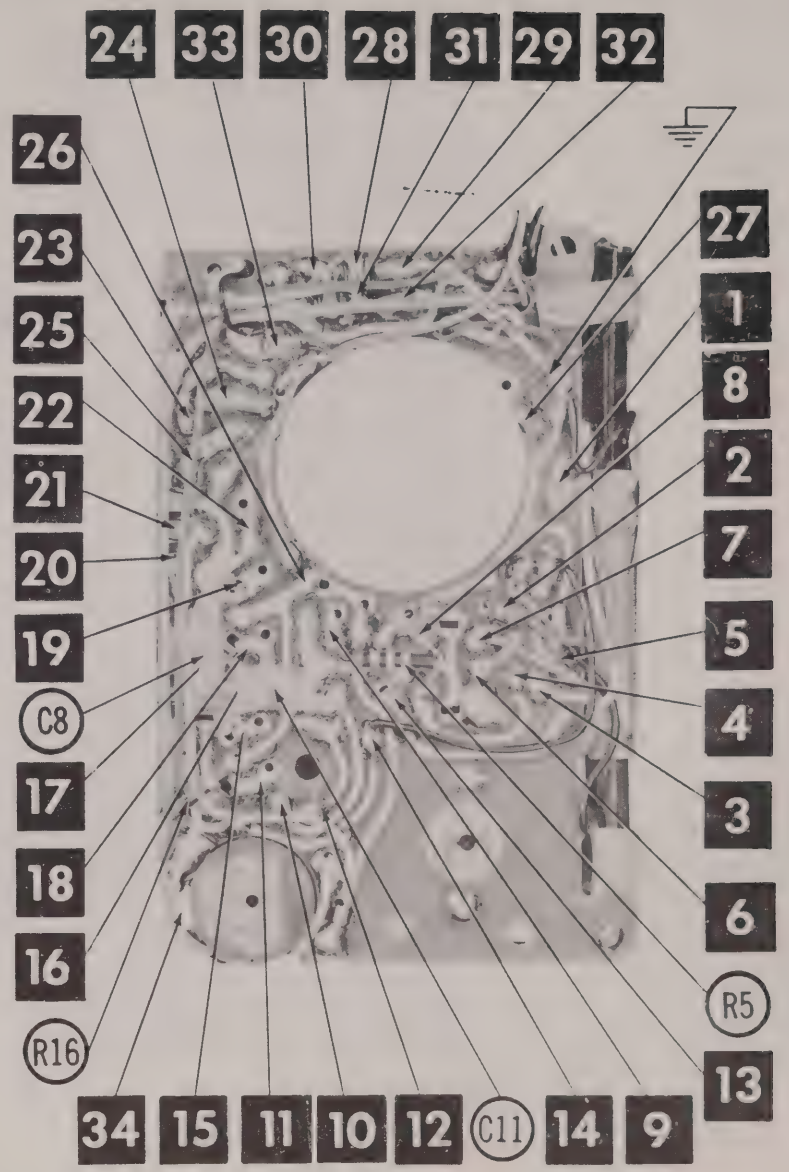


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Delmonico PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							
L5	3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Delmonico PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5 :	1	T-453						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Delmonico PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1100Ω CT	10-12Ω	OT-503				TA-26			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Delmonico PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω	PM-224A		

BATTERIES

ITEM No.	VOLTAGE	Delmonico PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604 TR-146R①	① Mercury Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Delmonico PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60 *		1N60	1N60	1N60	Detector (Pigtail)

* Some versions may use 1N34A in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Delmonico PART No.	NOTES
M3	Tuning Cap.		2 Gang

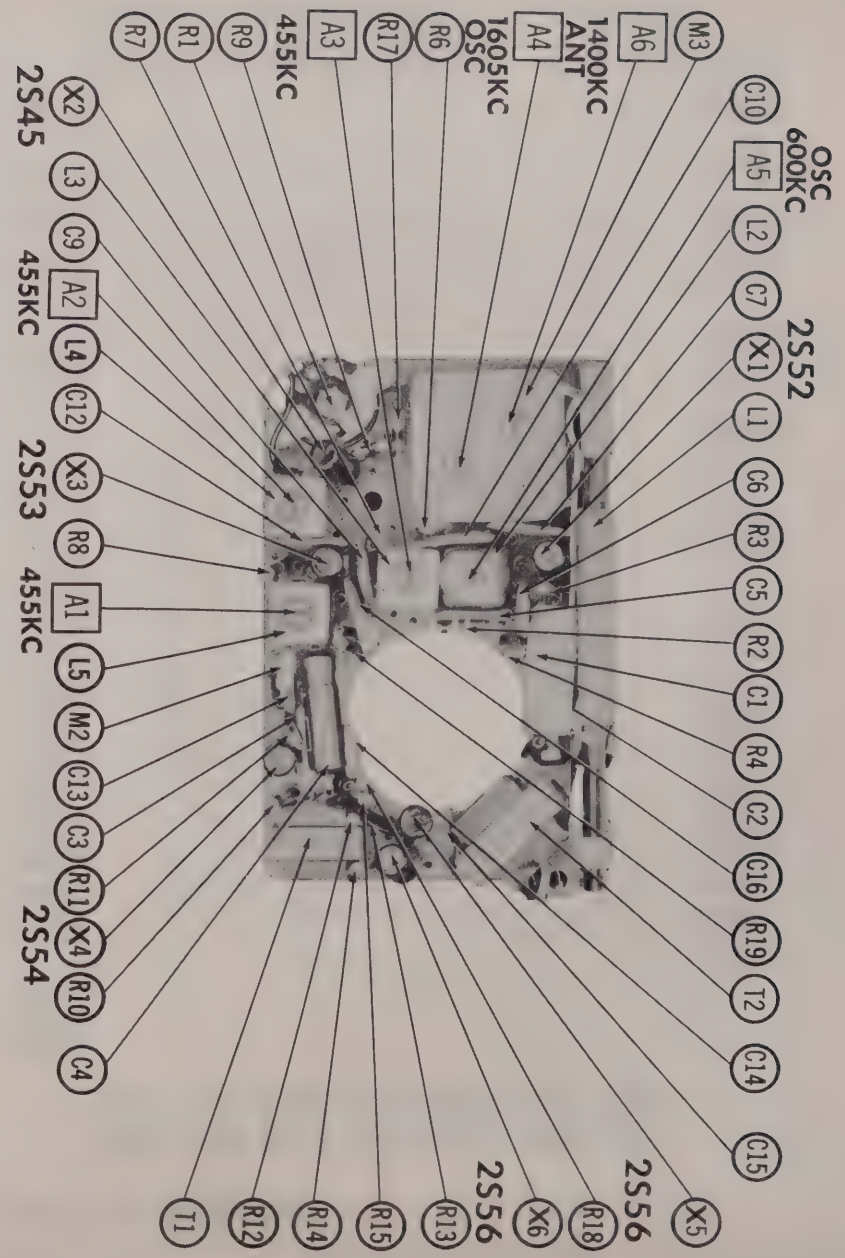
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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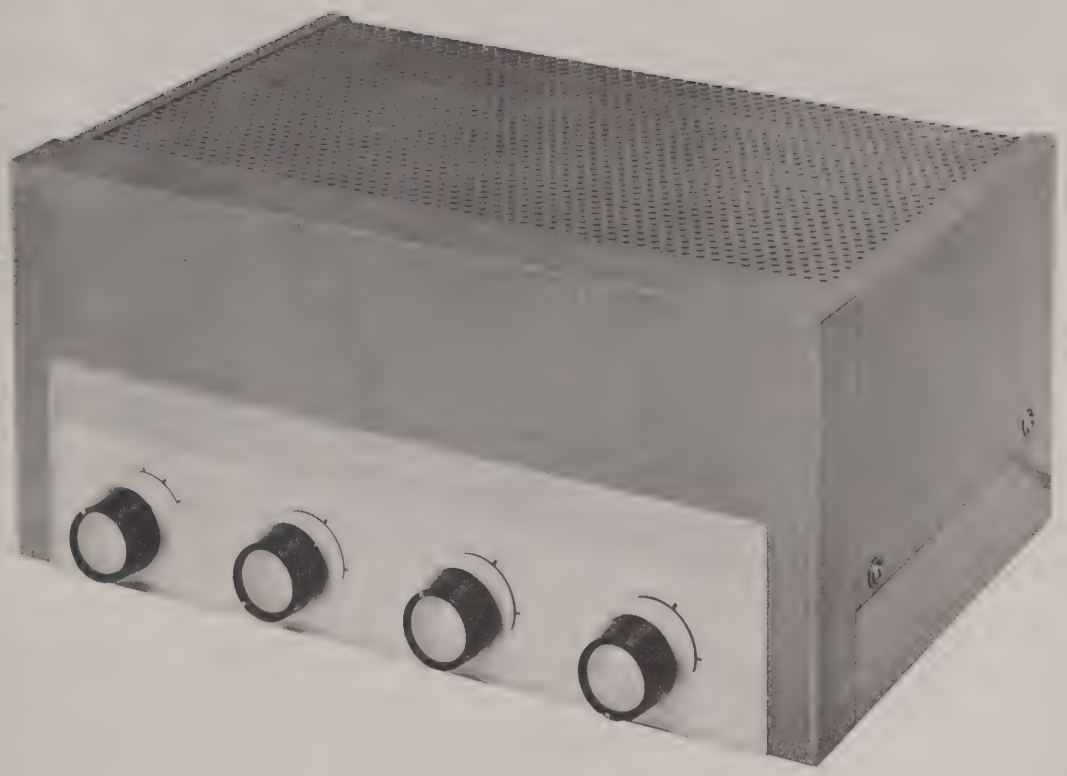
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GROMMES MODEL LJ-7

GROMMES
MODEL LJ-7



GROMMES
MODEL LJ-7

TRADE NAME	Grommes Model LJ-7		
MANUFACTURER	Precision Electronics Inc., 9101 King Ave., Franklin Park, Illinois		
TYPE SET	AC Operated 5 Tube Audio Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	60 Watts, .60 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JX384

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Phono Preamplifier	12AX7 (ECC83) *
V2	AF Amp. - Phase Inverter	12AX7A (ECC83) *
V3	Output	6BQ5 (EL84) *
V4	Output	6BQ5 (EL84) *
V5	Rectifier	EZ80/6V4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400		AFH4-78	D0640	FP429	TMQ-92	TVL-4734	
B	■30	350							
C	▲10	300							
D	20	25							
C2A	■10	250		AFH3-189-40	C1120	FP384.16	TMT-84	TVL-3708	
B	▲100	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	5000 10%		DI-5000		PM-6D5	6DP-3-503	JL-250	6TM-D5
C7	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C10	100		SI 100	D6-101	L10T1	CCD-101	UC-531	5GA-T1

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	VCK-2M1T	BT-78	A47F3-2meg	Q18-139X	UT-451	Volume
	1meg tap							
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	2meg	½	TCK-2M	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	TCK-500K-WS	B-60-S	A47-500K-S	Q13-133	U48	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

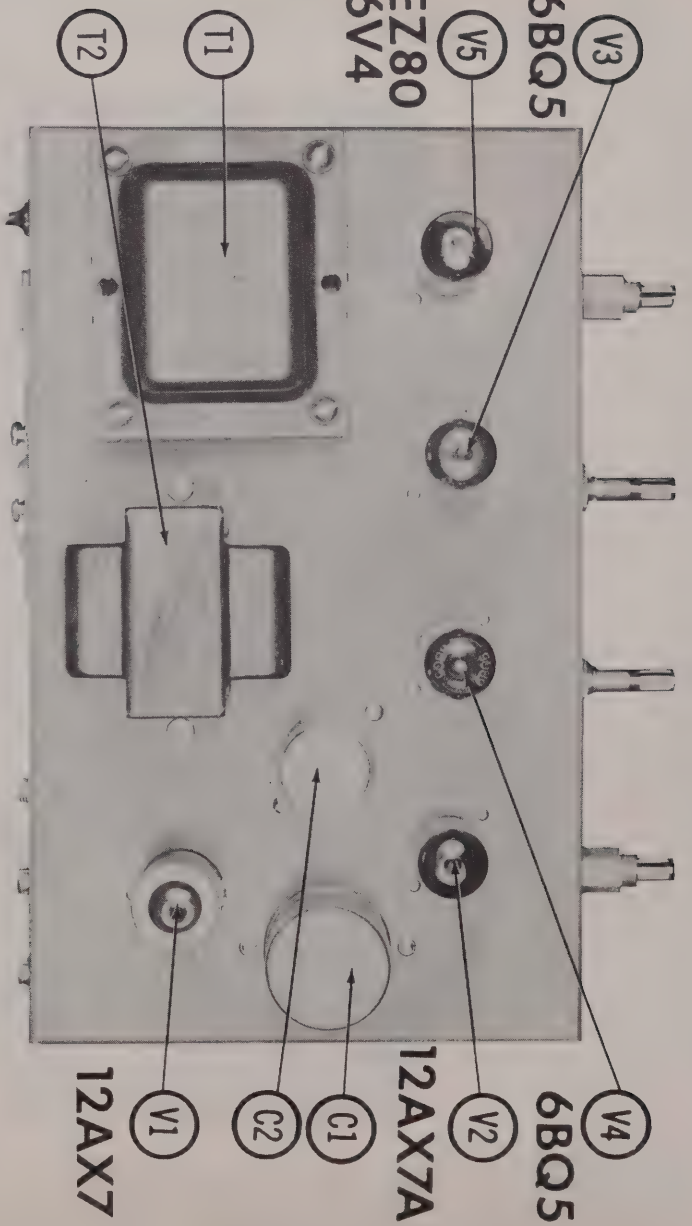
ITEM No.	RATING	REMARKS
R4	4.7meg	
R5	100K	
R6	10K	Note 1
R7	100K	
R8	1000Ω	
R9	18K	
R10	1meg	
R11	100K	

ITEM No.	RATING	REMARKS
R12	1000Ω	
R13	47K	
R14	100K	
R15	220K	
R16	100Ω	
R17	47K	
R18	220K	
R19	1000Ω	

ITEM No.	RATING	REMARKS
R20	220K	
R21	150Ω 7W	
R22	270K	
R23	4700Ω	
R24	47K	
R25	1000Ω	
R26	5600Ω 2W	

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .60A	640VCT @ .080A	6.3VCT @ 2.7A	TP-9	22R04			PM8408	22R04	R-9B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7200Ω CT	16Ω Taps @ 8Ω, 4Ω	TO-10C	24S55	A-2904	AU-609	A-3830	24S55	S-28X	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GROMMES PART No.	REPLACEMENT DATA
K1	Tone Compensating	800mmf, 2000mmf, 3000mmf, 33K, 100K, 100K, 3.3meg, 3.3meg	PC-1960	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1½A 250V			31201.5 (3AG 1½A 250V)	121004	AGC1½	4051

MISCELLANEOUS

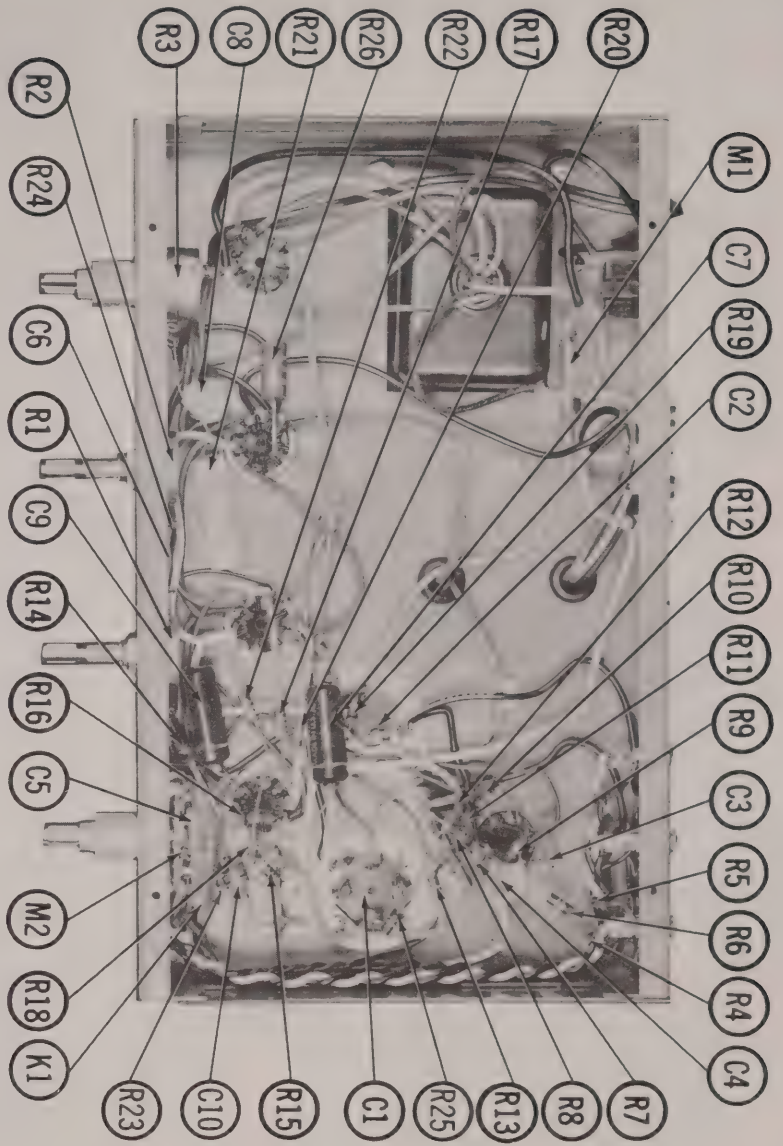
ITEM No.	PART NAME	GROMMES PART No.	NOTES
M2	Switch		Function Selector

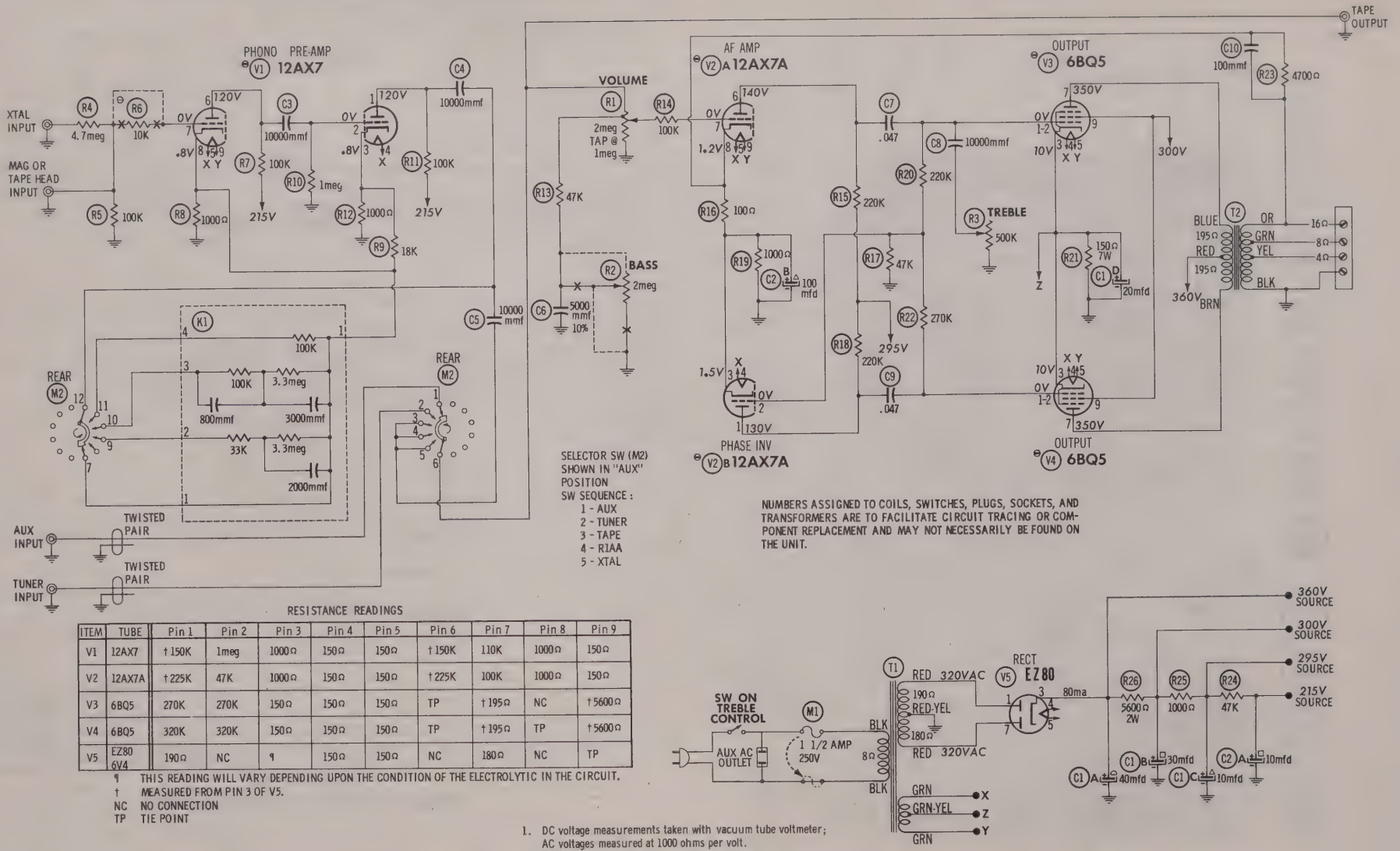
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†150K	1meg	1000Ω	150Ω	150Ω	†150K	110K	1000Ω	150Ω
V2	12AX7A	†225K	47K	1000Ω	150Ω	150Ω	†225K	100K	1000Ω	150Ω
V3	6BQ5	270K	270K	150Ω	150Ω	150Ω	TP	†195Ω	NC	†5600Ω
V4	6BQ5	320K	320K	150Ω	150Ω	150Ω	TP	†195Ω	TP	†5600Ω
V5	EZ80 6V4	190Ω	NC	¶	150Ω	150Ω	NC	180Ω	NC	TP

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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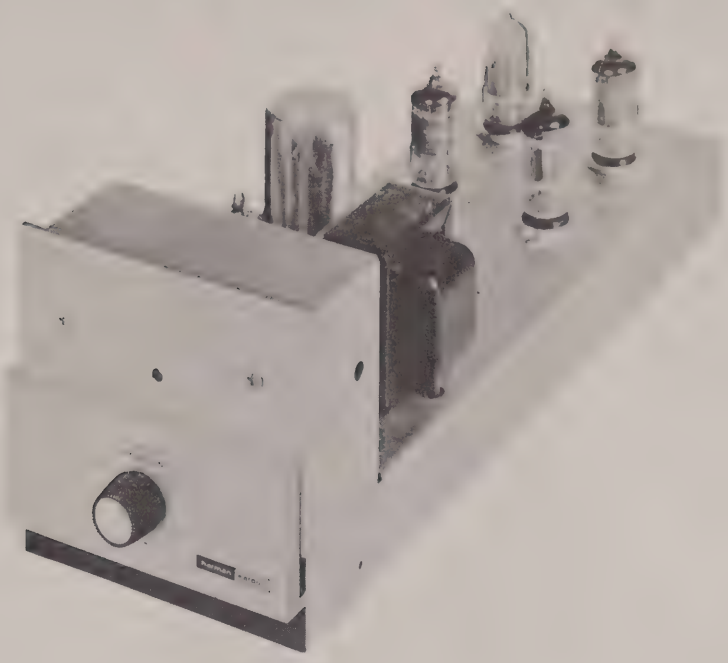
GROMMES MODEL LJ-7

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

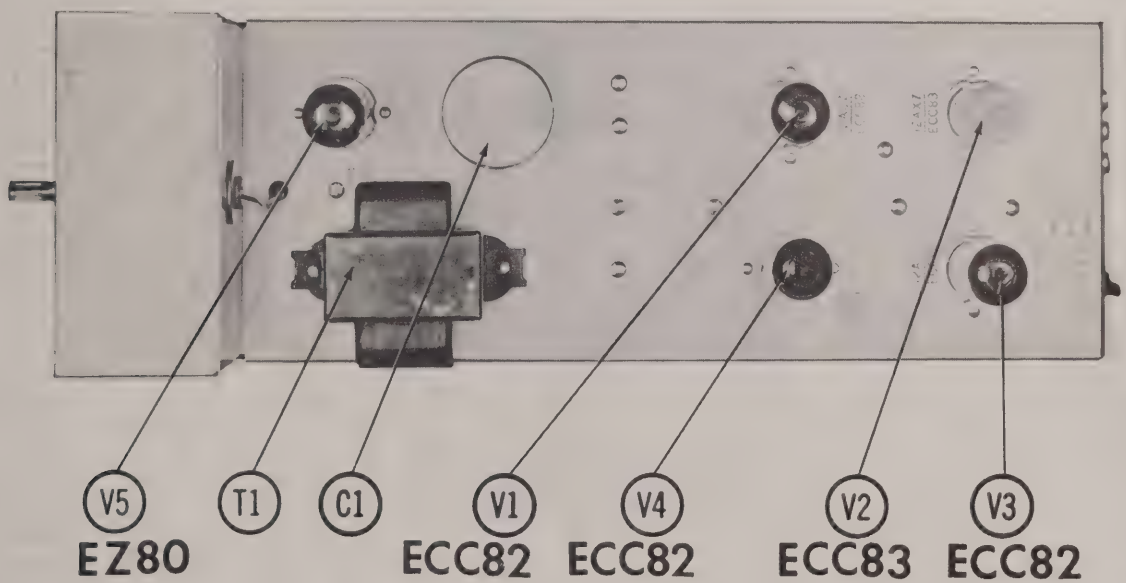
HARMAN-KARDON
MODEL MX20

HARMAN-KARDON
MODEL MX20



TRADE NAME	Harman-Kardon Model MX20
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.
TYPE SET	AC Operated 5 Tube Stereo Multiplex Adapter
POWER SUPPLY	105-125 Volts AC, 50-60 Cycles RATING 21 Watts, .23 Amp. @117 Volts AC

HARMAN-KARDON
MODEL MX20



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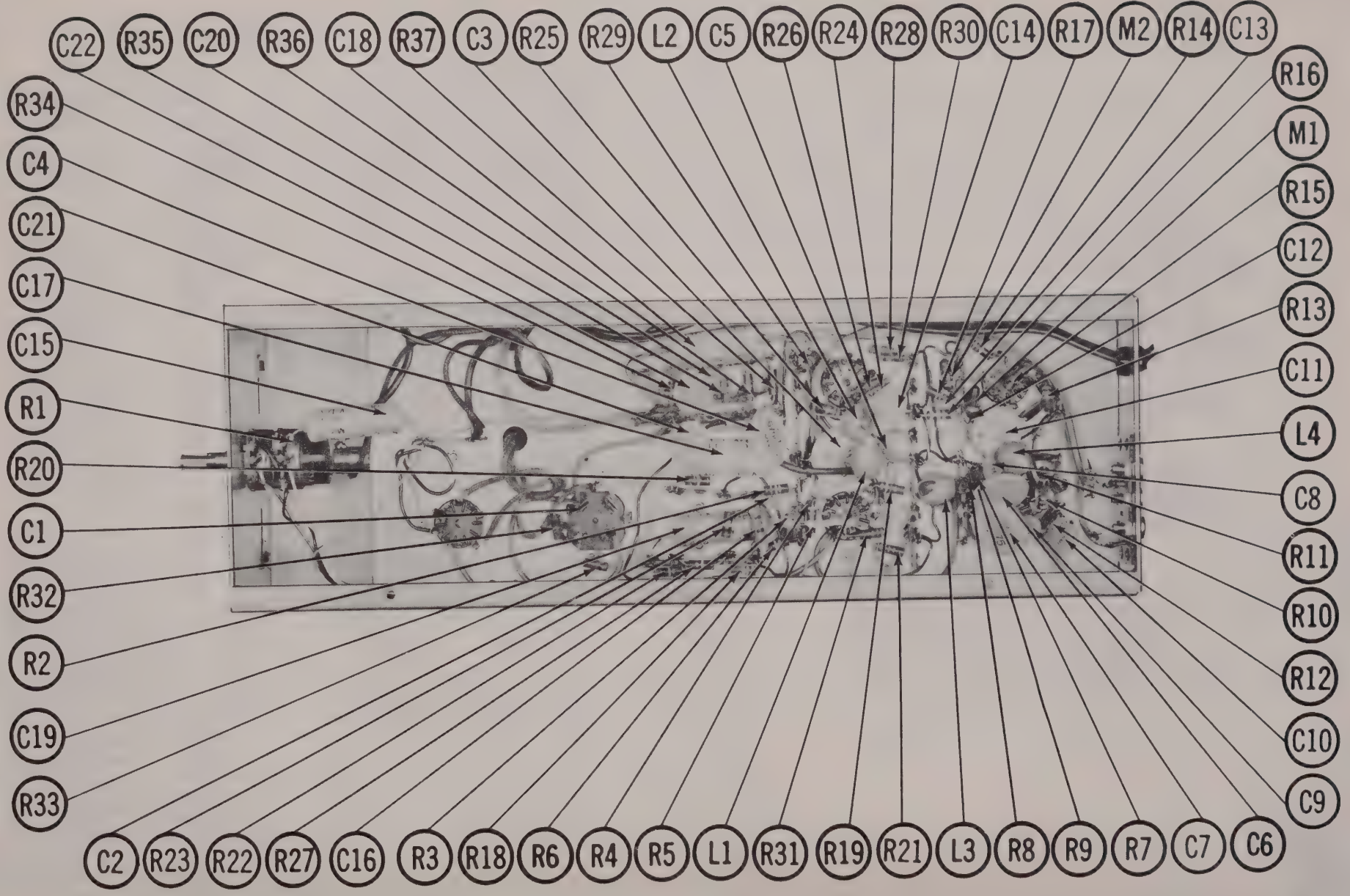
JZ427

SET 468 FOLDER 7



CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Sub Carrier Cathode Follower-Matrix Amp.	ECC82/12AU7
V2	Sub Carrier Amp.	ECC83/12AX7
V3	Cathode Follower-Sub Carrier Amp.	ECC82/12AU7
V4	Left Channel AF Amp. - Right Channel AF Amp.	ECC82/12AU7
V5	Rectifier	EZ80/6V4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	400	JE2763110	AFH4-06-40	C0340	FP376.8	TMT-38	TVL-3785	
B	■40	300			BR3045	TC77	TD-30-45	TVA-1711	
C	▲40	300							
D	10	300							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 N150					*		10TCP-T10
C3	7500 10%		DI-7500		1DR3D75	6DP-2-752	MCB471	10TS-D75
C4	7500 10%		DI-7500		1DR3D75	6DP-2-752	MCB471	10TS-D75
C5	3000 10%		DI-3000		1R5D3	CCS-302	JL-333	10TS-D30
C6	7500 10%		DI-7500		1DR3D75	6DP-2-752	MCB471	10TS-D75
C7	7500 10%		DI-7500		1DR3D75	6DP-2-752	MCB471	10TS-D75
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	1000 2000V		HVD-30-1000	DD30-102	HVB20D1	VCM-20-102	2HV-210	30GA-D10
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C11	1000 5000V			DD60-102	CUB60D1		6HV-210	60GA-D10
C12	47 N750		N750-SI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C13	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	5GA-T33
C14	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C15	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C16	1000 10%			DD-102	1R5D1	CCS-102	JL-210	10TS-D10
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C18	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C19	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C20	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C21	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C22	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		RV2763107					Stereo Dimension
B	500K							Stereo Dimension
C	Switch							Push Pull Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	68K	
R3	470K	
R4	330K	
R5	4700Ω	
R6	100K	
R7	1000Ω	
R8	100K	
R9	2200Ω	
R10	470K	
R11	100K	
R12	2200Ω	
R13	470K	
R14	2700Ω	
R15	10K	
R16	33K	
R17	82K	
R18	470K	
R19	2700Ω 5%	
R20	100K 5%	
R21	2700Ω 5%	
R22	100K 5%	
R23	100K 5%	
R24	220K 5%	
R25	47K	
R26	1000Ω	
R27	100K 5%	
R28	220K 5%	
R29	47K	
R30	1000Ω	
R31	2200Ω	
R32	1000Ω	
R33	1000Ω	
R34	220K	
R35	10K	
R36	100Ω	
R37	100Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Harman-Kardon PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke							4MH
L2	RF Choke					70F123A1		1.6MH
L3	RF Choke					70F123A1		1.6MH
L4	RF Choke							4MH

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .23A	500 VCT @.020A	6.3V@ 1.9A	FT2763109						R-3A①

① Drill New Mounting Holes

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Harman-Kardon PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M1	1N541		1N636	1N295	1N295	Multiplex Detector
M2	1N541		1N636	1N295	1N295	Multiplex Detector

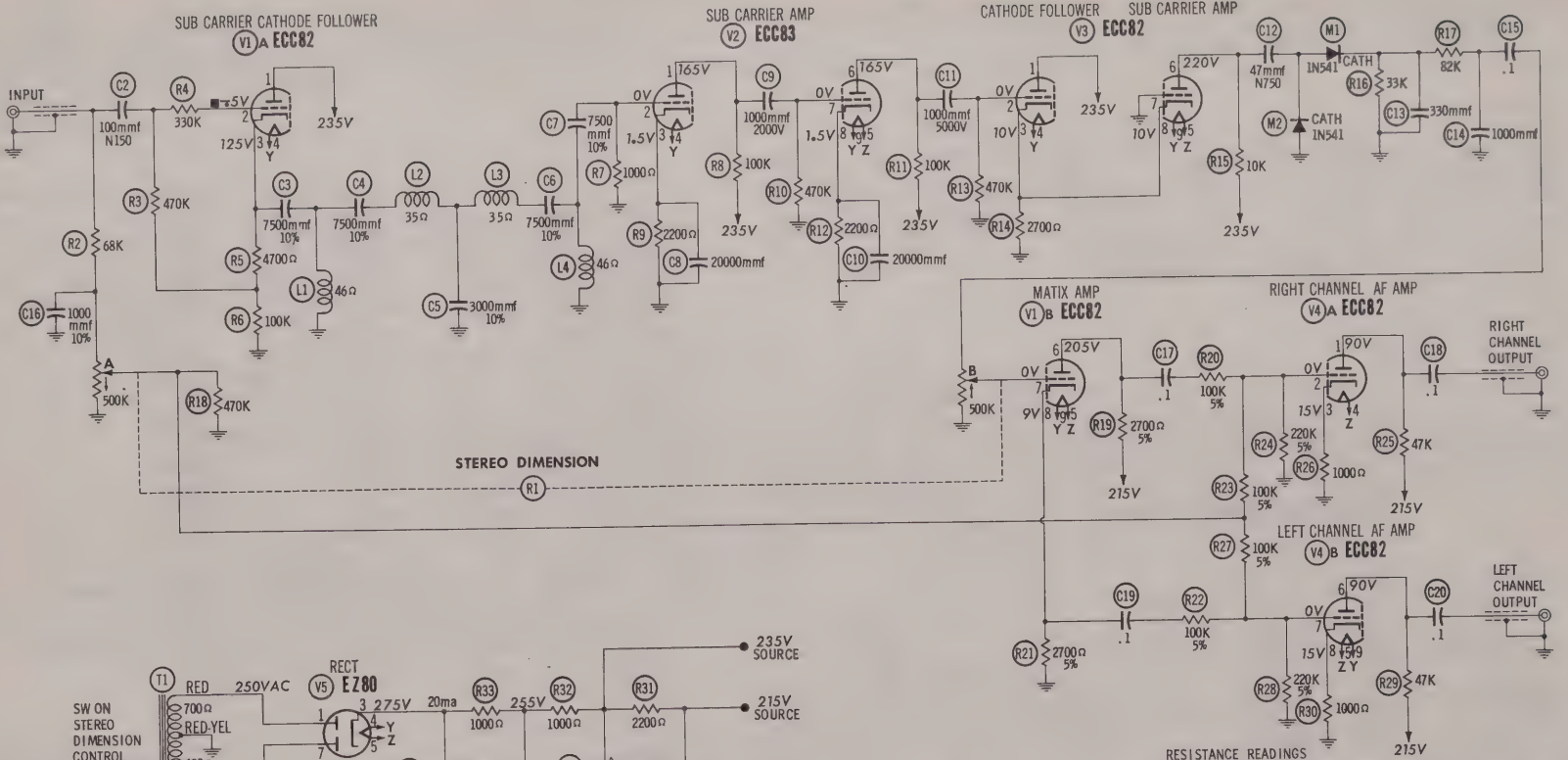
WIRING DATA

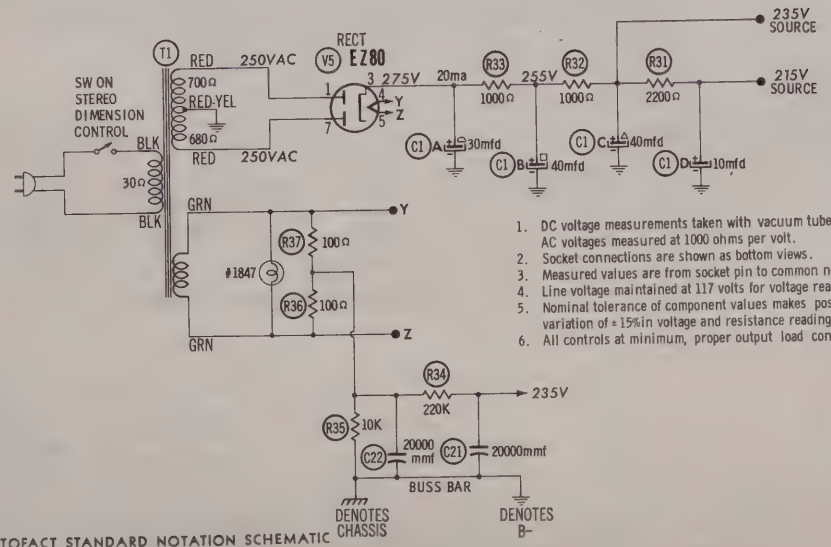
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

HARMAN-KARDON
MODEL MX20

FOLDER 7





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC82 12AU7	†2000Ω	900K	100K	10K	10K	†6900Ω	0Ω	2700Ω	10K
V2	ECC83 12AX7	†100K	1000Ω	2200Ω	10K	10K	†100K	470K	2200Ω	10K
V3	ECC82 12AU7	†2000Ω	470K	2700Ω	10K	10K	†12K	0Ω	2700Ω	10K
V4	ECC82 12AU7	†50K	130K	1000Ω	10K	10K	†50K	130K	1000Ω	10K
V5	EZ80 6V4	700Ω	NC	¶	10K	10K	NC	680Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V5.
▪ MEASURED FROM PIN 3 OF V1.
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

HARMAN-KARDON MODEL MX20

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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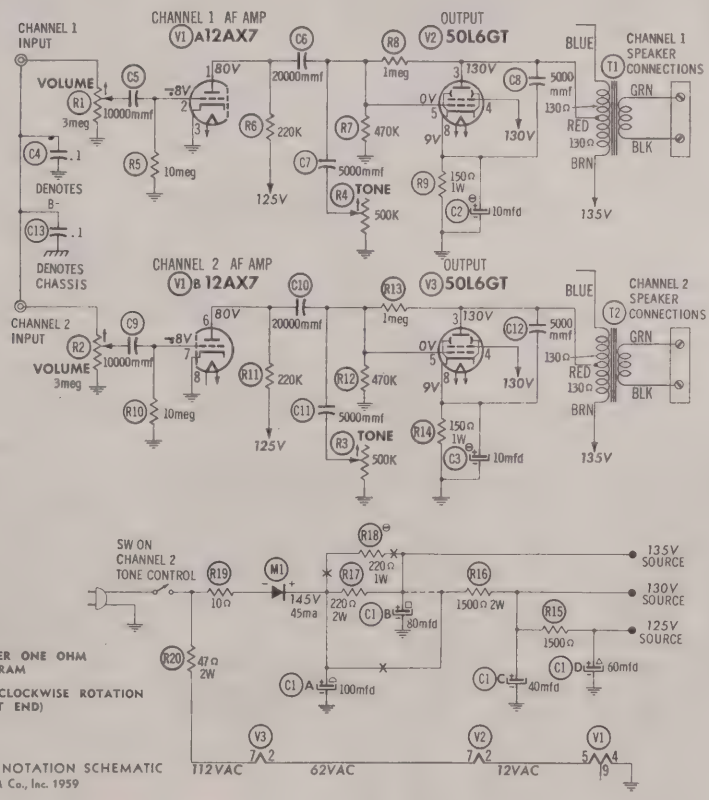
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

HARMONY MODEL SA-3

HARMONY
MODEL SA-3

TRADE NAME	Harmony Model SA-3
MANUFACTURER	Continental Manufacturing Inc., 1612 California St., Omaha, Nebraska
TYPE SET	AC-DC Operated 4 Tube Stereo Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 38 Watts, .46 Amp. @117 Volts AC



Pin No	V1	V2	V3
1	†220K	NC	NC
2	10meg	12Ω	62Ω
3	0Ω	†240Ω	†240Ω
4	0Ω	†1500Ω	†1500Ω
5	12Ω	470K	470K
6	†220K	NC	NC
7	10meg	62Ω	112Ω
8	0Ω	150Ω	150Ω
9	6Ω		

† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HARMONY
MODEL SA-3

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JV418

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V2 V3	Channel 1 Output Channel 2 Output	50L6GT 50L6GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HARMONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲100	150		AFH4-01-40	D0014	FP412	TMQ-115	TVL-4445	
B	■80	150							
C	40	150							
D	▲60	150							
C2	10	50		PRS1320	BBR10-50	TC32	TD-10-50	TVA-1304	Note 1
C3	10	50		PRS1320	BBR10-50	TC32	TD-10-50	TVA-1304	Note 1

Note 1. Some versions may use 4mfd@25V or 50mfd@25V in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C7	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C8	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C11	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C12	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C13	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HARMONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3meg	½	BA811-2735	B-85	A47-3meg-Z	Q13-140	U57	Volume 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	3meg	½	BA811-2735	B-85	A47-3meg-Z	Q13-140	U57	Volume 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½		B-60-S	A47-500K-Z	Q13-133	U48	Tone 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R4A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Tone 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

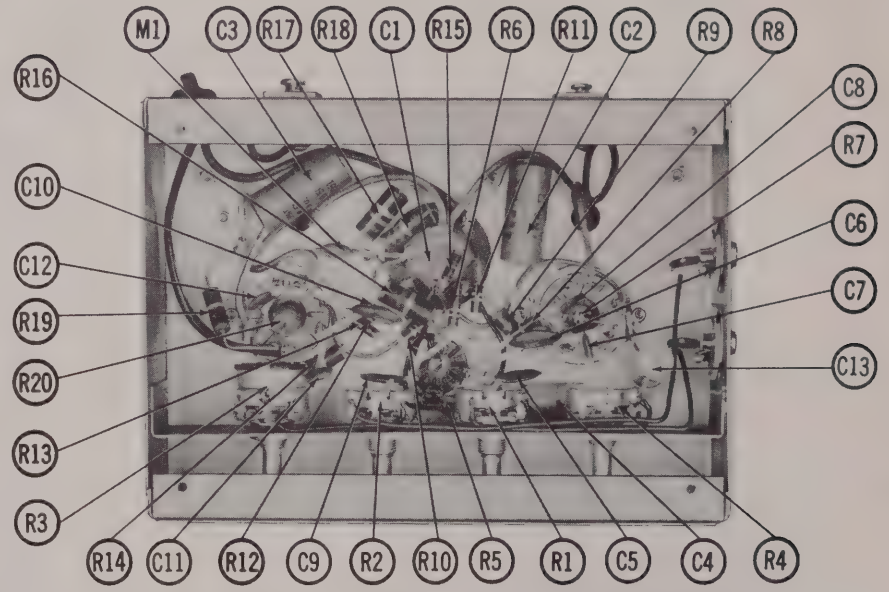
ITEM No.	RATING	REMARKS
R5	10meg	
R6	220K	
R7	470K	
R8	1meg	
R9	150Ω 1W	
R10	10meg	

ITEM No.	RATING	REMARKS
R11	220K	
R12	470K	
R13	1meg	
R14	150Ω 1W	
R15	1500Ω	
R16	1500Ω 2W	

ITEM No.	RATING	REMARKS
R17	220Ω 2W	Note 1
R18	220Ω 1W	
R19	10Ω	
R20	47Ω 2W	

Note 1. Not used in some versions.

CHASSIS BOTTOM VIEW



TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HARMONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω CT	3-4Ω	14-W-2	24S64	A-2902	AU-604	A-3849	24S64		One half of primary not used.
T2	2400Ω CT	3-4Ω	14-W-2	24S64	A-2902	AU-604	A-3849	24S64		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	HARMONY PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	096A	①	5E4 ①	HA154 ①	K200 ①	SR200 ①	① Silicon Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA

OLYMPIC MODELS SA-812, SA-813, SA-814, L (Ch. 139)

OLYMPIC MODELS SA-812,
SA-813, SA-814, L (Ch. 139)

MODEL SA-813

OLYMPIC MODELS SA-812,
SA-813, SA-814, L (Ch. 139)

TRADE NAME	Olympic Models SA-812, SA-813, SA-814, SA-814L (Ch. 139)
MANUFACTURER	Olympic Radio & TV Inc., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 3 Tube Phono Amplifier
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 55 Watts, .55 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JX402

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	AF Amp. -Phase Inv.	12AX7
V2	Output	50C5

ITEM No.	USE	TYPE
V3	Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲125	150	CO-4032	AFH2-20-150	XB0184.5	FP217.7	TMS-41 TD-150-150	TVL-2443.3	
B	■125	150							
C	▲20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C3	2.2mfd 3V	#CO25691		UK-225				HY-150
C4	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C5	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	330 10%		DI-330	DD-331	L10T33	CCD-331	JL-330	10TS-T33
C7	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C8	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C10	2.2mfd 3V	#CO25691		UK-225				HY-150

Olympic Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg *	½	PT-25421	C1-70 *		Q18-137XX	UDT-289	Loudness
R2A	3meg	⅓	PT-2160	B-85	A47-3meg-Z	Q13-140	U57	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-3	SWE-21	76-2	US-27	
R3A	2meg †	½	PT-567	BT-80	A47F6-2meg	Q13-139X	UT-449	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Taps @ 350K, 650K
† Tap @ 625K (Not used).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

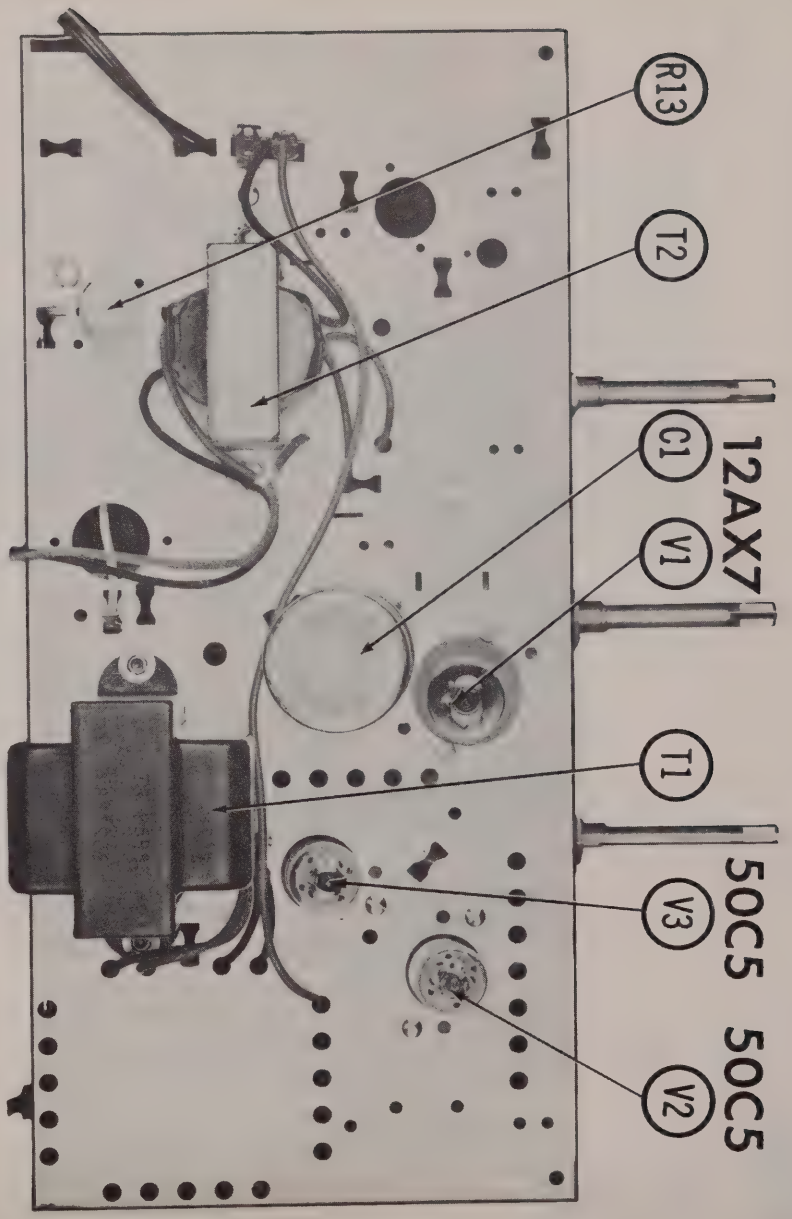
ITEM No.	RATING	REMARKS
R4	470K	
R5	3300Ω	
R6	100K	
R7	470K	

ITEM No.	RATING	REMARKS
R8	470K	
R9	470K	
R10	180Ω 1W	
R11	100K	

ITEM No.	RATING	REMARKS
R12	1000Ω 1W	
R13	740Ω 20W	#RE25939

Olympic Part Number.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .55A	117V ⓐ .40A (AC)		TR25985	23V80	P-3096			23V80	N-68X

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4300Ω CT	3-4Ω	TR25743	24S07	A-2901	AU-600	A-3823	24S07	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	SK1906 ①	8A31	① Model SA-813
SP2	4"	PM	3-4Ω	SK4342 ②	4A07	② All Models
SP3	4"	PM	3-4Ω	SK4342 ②	4A07	③ Models SA-812, SA-814
	6"x 9"	PM		SK5738 ③		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Loudness Comp.	50mmf, 100mmf, (2) 2500mmf, (2) 100K	PC-25420	Centralab PC-325 Sprague TC-5

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	OLYMPIC PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.065A	RF3160 ①	T150 ①	1235AH ①	150 ①	SR200 ②	① Selenium Type ② Silicon Type

CABINETS & CABINET PARTS

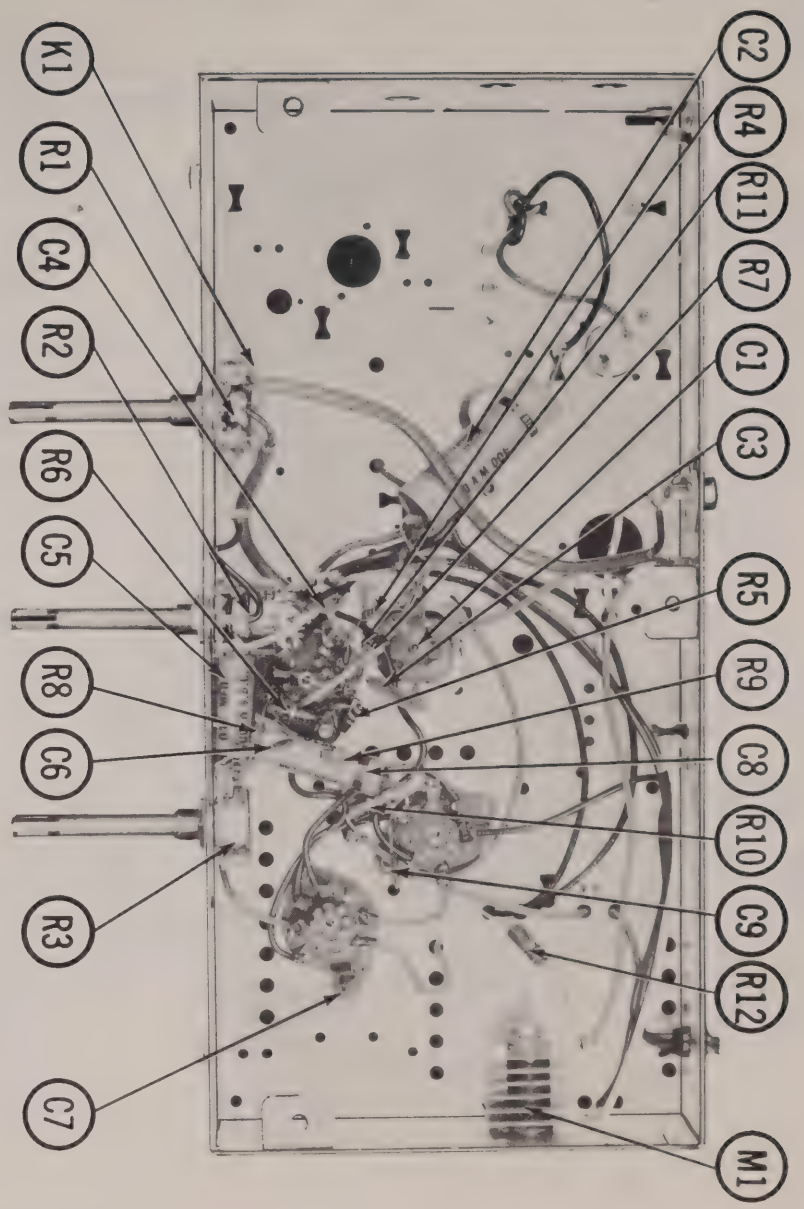
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

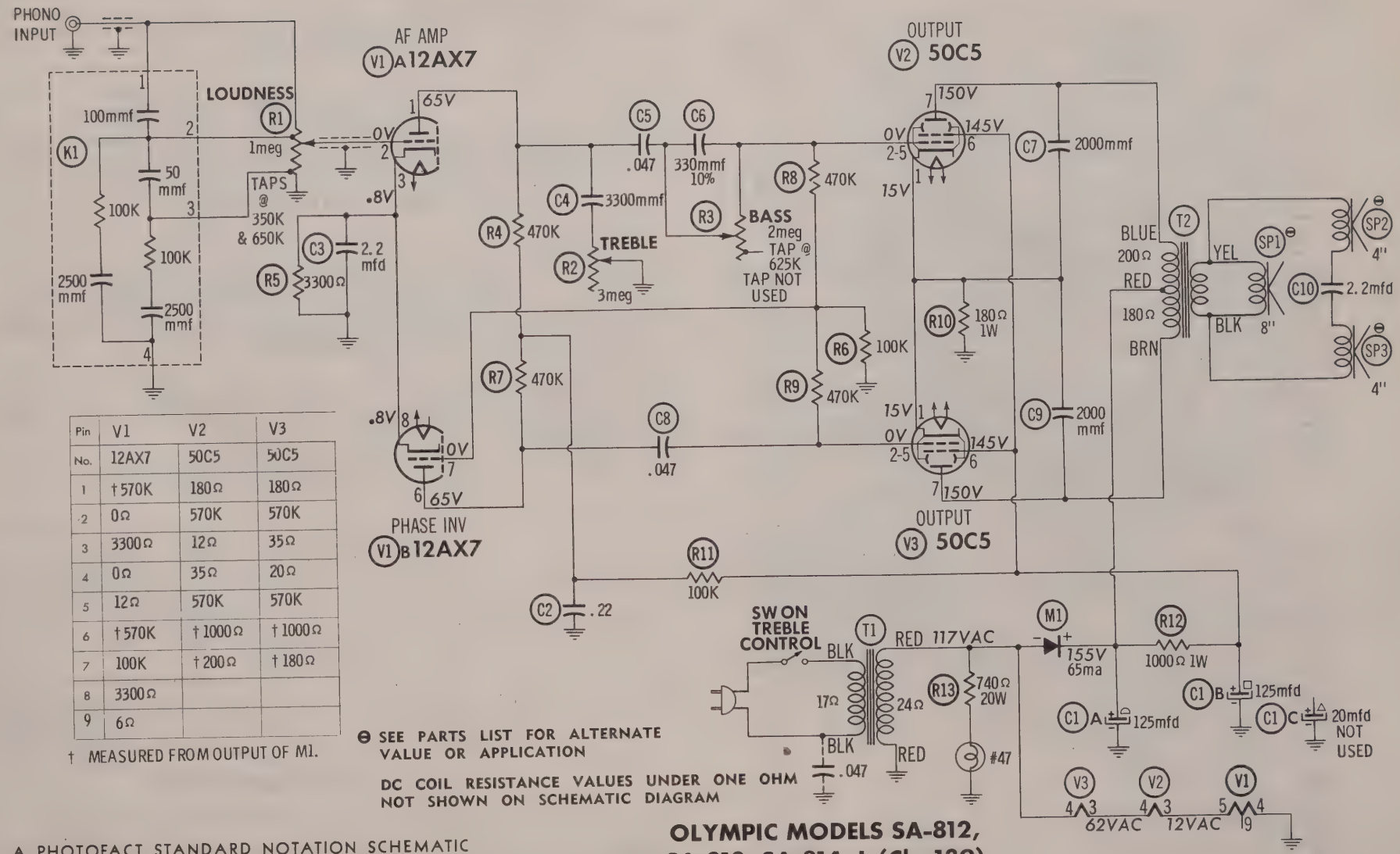
NAME	PART NO.	DESCRIPTION
Knob	KN25959	Off-Treble, Bass, Loudness
Cabinet	CA26022	Model SA812
Cabinet	CA26024	Model SA813

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





Pin No.	V1	V2	V3
1	†570K	180Ω	180Ω
2	0Ω	570K	570K
3	3300Ω	12Ω	35Ω
4	0Ω	35Ω	20Ω
5	12Ω	570K	570K
6	†570K	†1000Ω	†1000Ω
7	100K	†200Ω	†180Ω
8	3300Ω		
9	6Ω		

† MEASURED FROM OUTPUT OF M1.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

OLYMPIC MODELS SA-812, SA-813, SA-814, L (Ch. 139)

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PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PHILCO MODEL T-65

PHILCO MODEL T-65

TRADE NAME	Philco Model T-65
MANUFACTURER	Philco Corporation, Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	3 Volts DC
RATING	10.5MA@3 Volts DC (No Signal, Min. Volume) 18MA@3 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A6, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	600KC	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang.
3.		"	1620KC	Tuning gang fully open.	"	A6	Adjust for maximum output.
4.		"	1400KC	Tune to 1400KC Signal	"	A7	Adjust for maximum output. Repeat Steps 2, 3, and 4 until no further improvement is obtained. Always make Step 4 last step.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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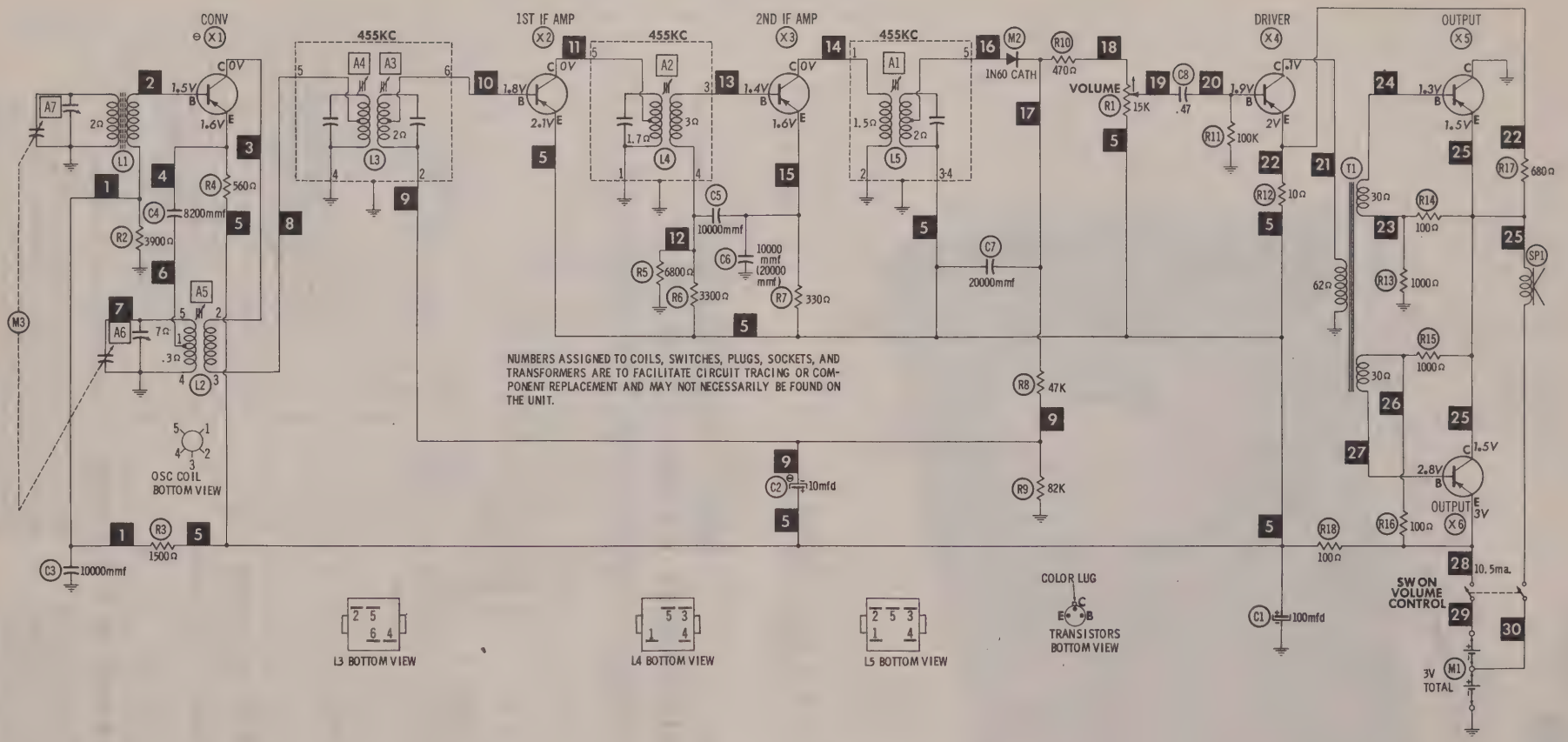
JF370

SET 468 FOLDER 10



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE MEASUREMRNTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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with CIRCUITRACE®

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PHILCO MODEL T-65

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR. PART No.	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	34-6000-3	Conv. (T-1033 ♦)	CBS2N180		2N486		PNP
X2	34-6000-18	1st IF Amp. (T-1459)			2N483		PNP
X3	34-6000-19	2nd IF Amp. (T-1460)			2N483		PNP
X4	34-6001-16	Driver (T-1001)			2N362		PNP
X5	34-6008	Output (T-1007)			2N359		PNP } Matched
X6	34-6008	Output (T-1007)			2N359		PNP } Pair

♦ Alternate Type T-1300.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	3	30-2588-2	PWE3100	EC100-6	TT6X100	ML100-3	TE-1059.5	
C2	10	6	30-2591-3	XPP6010	NLW10-6	TT6X10	ML10-6	TE-1087	①

① Some versions may use a 3 volt unit in this application (Part #30-2588-1).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	8200		BPD-008	DD16-802	HVE16D8	CCD-822	B-282	20HKB-D8
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	10000 (20000mmf)		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S2
C8	.47			TCZ-R5				

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	15K	½	33-5575-14					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	3900Ω	
R3	1500Ω	
R4	560Ω	
R5	6800Ω	
R6	3300Ω	
R7	330Ω	

ITEM No.	RATING	REMARKS
R8	47K	
R9	82K	
R10	470Ω	
R11	100K	
R12	10Ω	
R13	1000Ω	

ITEM No.	RATING	REMARKS
R14	100Ω	
R15	1000Ω	
R16	100Ω	
R17	680Ω	
R18	100Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		PHILCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	33-4668-9						
L2	Osc. Coil	32-4669-2						
L3	1st IF Trans.	32-4738-6						
L4	2nd IF Trans.	32-4738-7						
L5	3rd IF Trans.	32-4738-8						

PRINTED BOARD

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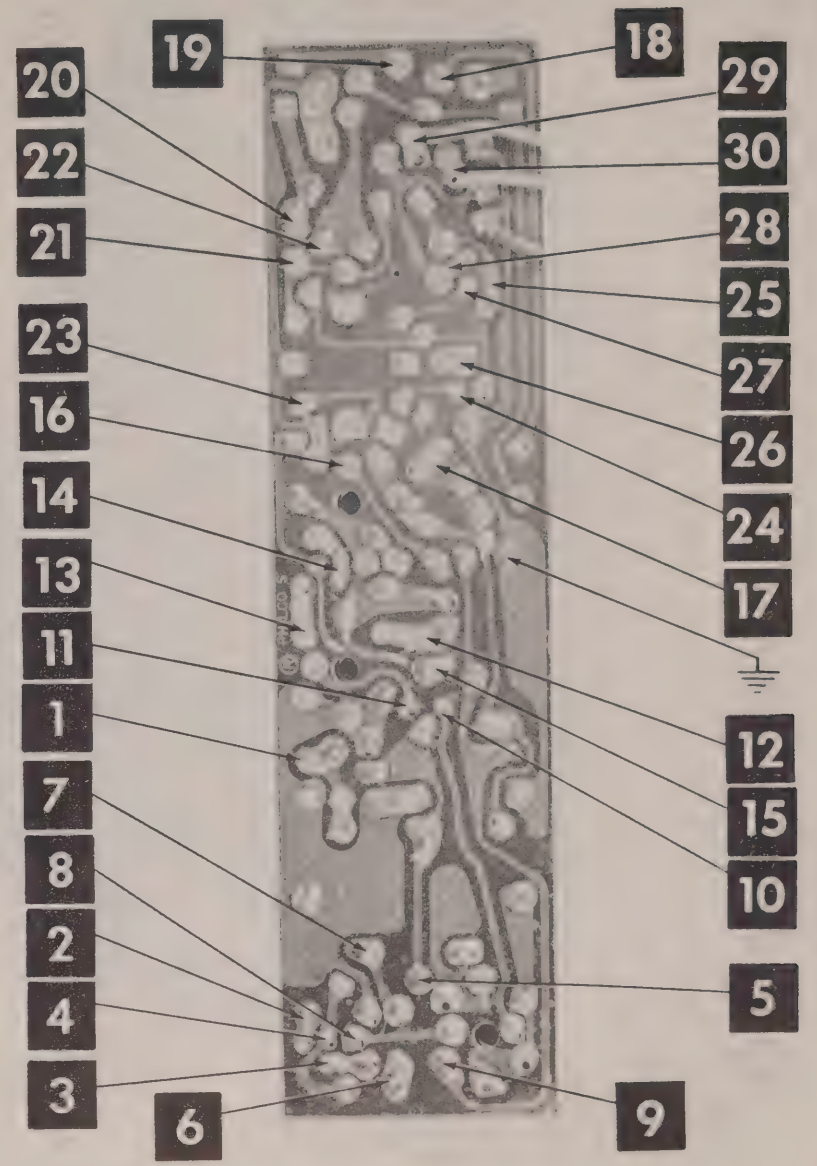


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.7	: 1	32-8838-2						
		SEC. 2							
	1.7	: 1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	3½"	PM	8-9Ω	36-1652-1	3A07Z8.5	

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			230		A100		M-13R	2 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	324-0006-3	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Tuning Cap Printed Board	31-2783-12 54-6575-2	2 Gang

CABINETS & CABINET PARTS

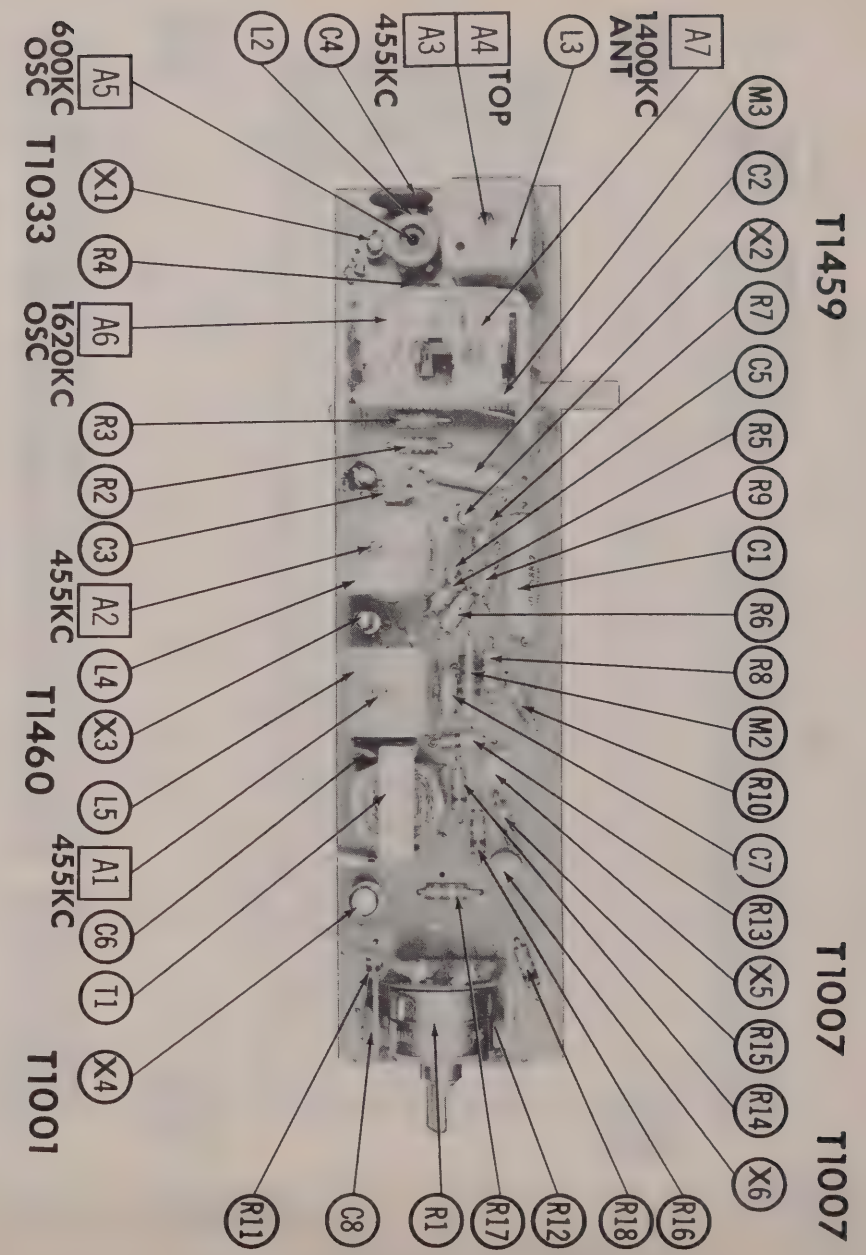
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	54-6292-5	Tuning
Knob	54-6421-1	Volume
Cabinet & Trim	424-8007	Ivory & Turquoise
Cabinet & Trim	424-8007-1	Ivory & Gold
Cabinet Back	54-6939-2	Truquoise
Cabinet Back	54-6939-3	Gold
Dial Plate	28-12260	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PRECISION MODEL 30PA

PRECISION
MODEL 30PA

PRECISION
MODEL 30PA

TRADE NAME	Precision Model 30PA
MANUFACTURER	Precision Electronics, Inc., 9101 King Street, Franklin Park, Illinois
TYPE SET	AC Operated 6 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 87 Watts, .82 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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HX989R

SET 468 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Preamplifier	12AX7
V2	AF Amplifier	12AX7
V3	AF Amp. - Phase Inv.	12AX7
V4	Output	6L6GB
V5	Output	6L6GT
V6	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PRECISION PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400	①	AFH4-18	D0170	FP444.5 TC72	TMQ-18	TVL-4758.4	
B	■20	400							
C	▲20	350							
D	10	350		PR8350V10	BR1045	TC52	TD-10-250	TVA-1504	
C2	10	250							

① Some versions may use 40-30-10-20mfd @ 400-350-300-25 V in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

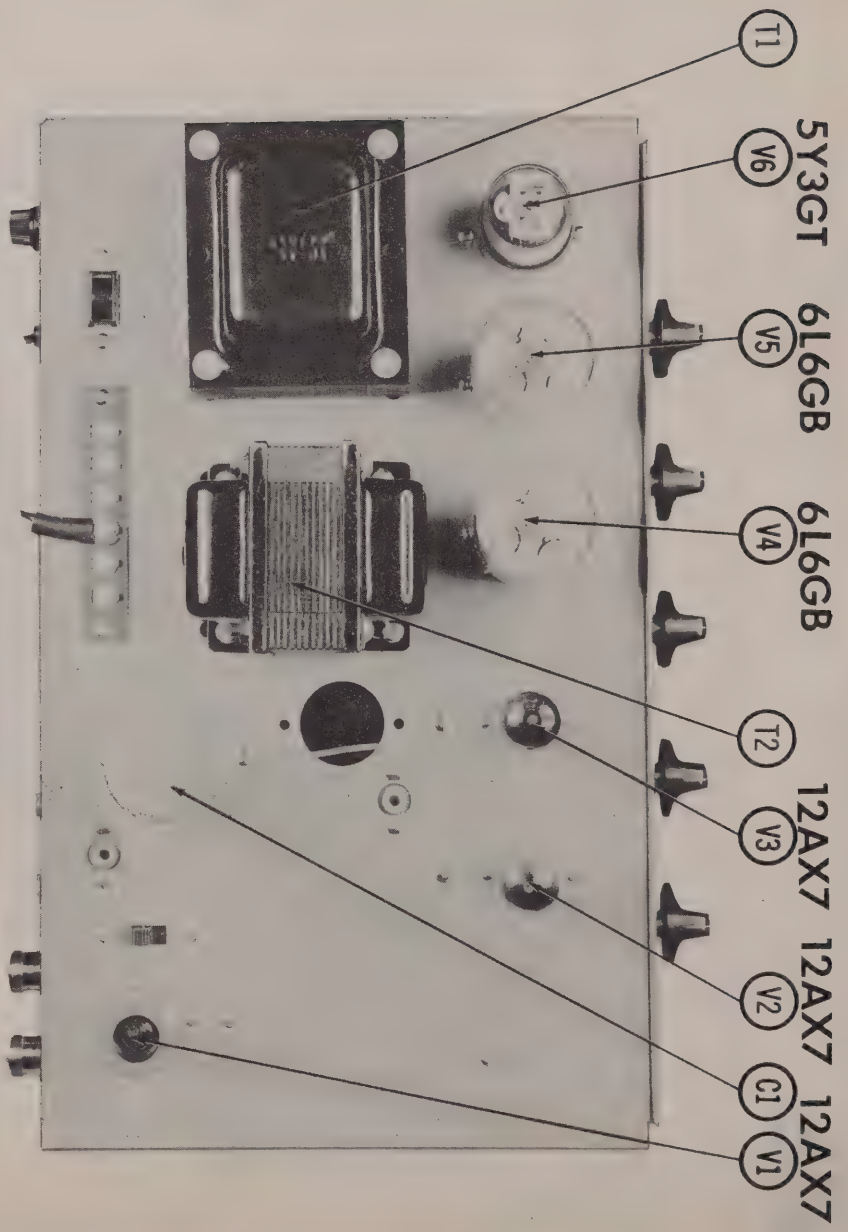
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C7	3000 10%		DI-3000					10TS-D30
C8	800 10%							10TS-T80
C9	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C10	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C11	5 10%		NPO-5I 5	D6-050	C10V5C	CCD-100		10TCC-V50
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C13	470 10%		DI-470	MD-471		CCD-471	JL-347	10TS-T47
C14	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PRECISION PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	GVC500K	B-60	A47-500K-Z	Q13-133	U48	Mic 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	500K	½	GVC500K	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	500K	½	GVC500K	B-60	A47-500K-Z	Q13-133	U48	Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R4A	500K	½	GVC500K	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	500K	½	G500KWS †	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Off-On

† Some versions may use a 2meg control in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PRECISION PART No.	NOTES
R6	47K			
R7	10K 5%			
R8	3.3meg			
R9	100K			
R10	3.3meg			
R11	100K			
R12	100K			
R13	470K			
R14	470K			
R15	470K			
R16	100K			
R17	1meg			
R18	1000Ω			

ITEM No.	RATING OHMS	RATING WATT	PRECISION PART No.	NOTES
R19	470K			
R20	220K			
R21	1000Ω			
R22	100K			
R23	100K 5%			
R24	120K			
R25	3900Ω			
R26	5600Ω	2		
R27	120K			
R28	250Ω	10		
R29	1000Ω			
R30	22K			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PRECISION PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .82A	700VCT @ .100A	5V @ 2A	TP4A		P-2952			24R04U	R-11B
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 2.9A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PRECISION PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5700Ω CT	250Ω (70V) Tap @ 16Ω, 8Ω, 4Ω	TO-20P	22S97 ①	A-3131		A-3800	22S97 ①	S-60A ①	① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PRECISION PART No. FUSE	PRECISION PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 250V			312002. (3AG 2A 250V)	342001	AGC2	HKP

MISCELLANEOUS

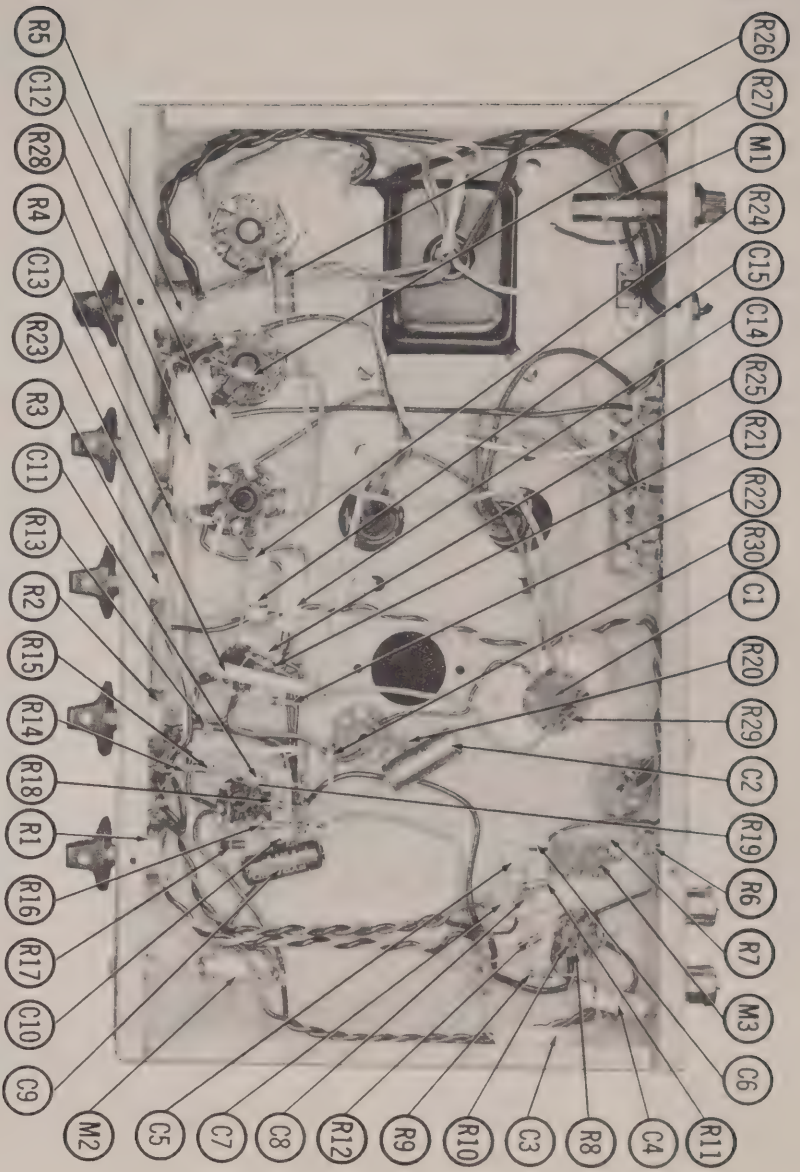
ITEM No.	PART NAME	PRECISION PART No.	NOTES
M2	Lamp		#51
M3	Switch		Magnetic Pickup-Mic. 2 (DPDT, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

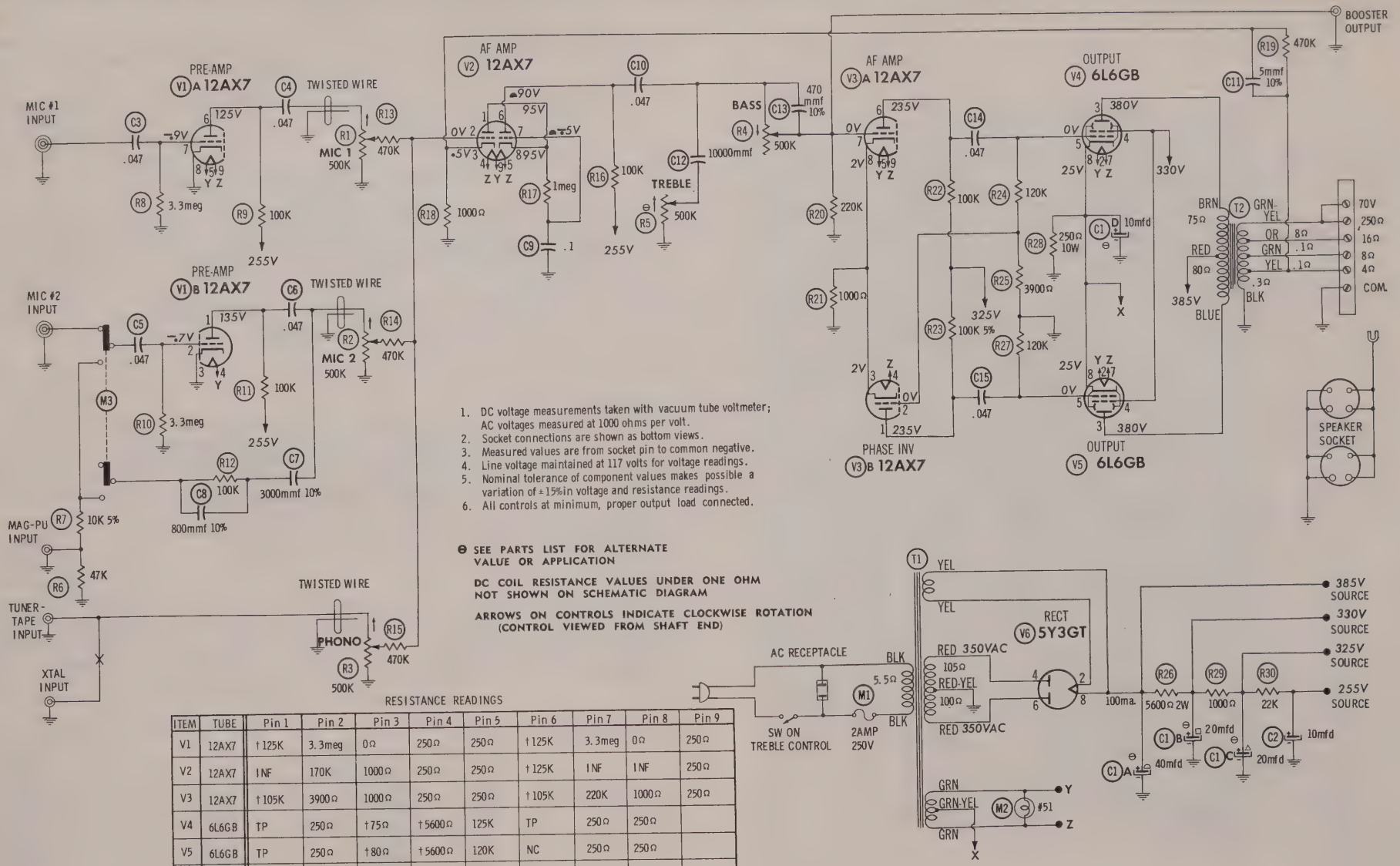
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS-BOTTOM VIEW



PRECISION
MODEL 30PA

FOLDER 11



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†125K	3.3meg	0Ω	250Ω	250Ω	†125K	3.3meg	0Ω	250Ω
V2	12AX7	INF	170K	1000Ω	250Ω	250Ω	†125K	INF	INF	250Ω
V3	12AX7	†105K	3900Ω	1000Ω	250Ω	250Ω	†105K	220K	1000Ω	250Ω
V4	6L6GB	TP	250Ω	†75Ω	†5600Ω	125K	TP	250Ω	250Ω	
V5	6L6GB	TP	250Ω	†80Ω	†5600Ω	120K	NC	250Ω	250Ω	
V6	5Y3GT	NC	¶	NC	105Ω	NC	100Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V6.
▪ MEASURED FROM PIN 8 OF V2.
NC NO CONNECTION
TP TIE POINT

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PRECISION MODEL 30PA

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EIA

SABA MODEL 400 9T

TRADE NAME	Saba Model 400 9T
IMPORTER	A. E. Dufenhorst Co., 121 N. Third Street, Rockford, Illinois
TYPE SET	AC Operated 12 Tube FM-BC-SW-LW Receiver With Automatic Tuning
POWER SUPPLY	110-120 Volts AC, 60 Cycles (or) 220 Volts AC RATING 100 Watts, .95 Amp. @ 117 Volts AC

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EC92	†27K	TP	0Ω	.1Ω	0Ω	1.1meg	0Ω		
V2	EC92	†12K	TP	0Ω	.1Ω	0Ω	1meg	0Ω		
V3	ECH81	†▪25K	200K ▪1.5meg	0Ω	.1Ω	0Ω	†3800Ω	0Ω ▪47K	†▪33K	0Ω ▪47K
V4	EF89	0Ω	200K ▪1.5meg	0Ω	.1Ω	0Ω	0Ω	†3800Ω	†82K †▪150K	0Ω
V5	EBF89	†150K	100K ▪1meg	0Ω	.1Ω	0Ω	†3800Ω	320K	TP	20K
V6	EABC80	220K	220K	440K	.1Ω	0Ω	700K	0Ω	1meg	†36K
V7	EM84	15K ▪3.5meg	NC	0Ω	.1Ω	0Ω	640Ω	470K	NC	470K
V8	EF86	†300K	0Ω	0Ω	.1Ω	0Ω	†240K	0Ω	0Ω	2.3meg
V9	EC92	†45K	NC	.1Ω	0Ω	NC	1meg	22K		
V10	EL84	1meg	1meg	120Ω	.1Ω	0Ω	NC	†470Ω	NC	†270Ω
V11	EL84	1meg	1meg	120Ω	.1Ω	0Ω	NC	†470Ω	NC	†270Ω
V12	ECL80	†22K	750K	0Ω	.1Ω	0Ω	†2200Ω	0Ω	†47K	1meg

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

† MEASURED FROM OUTPUT OF M1.

▪ MEASURED IN "AM" POSITION

■ MEASURED FROM PIN 7 OF V9.

NC NO CONNECTION

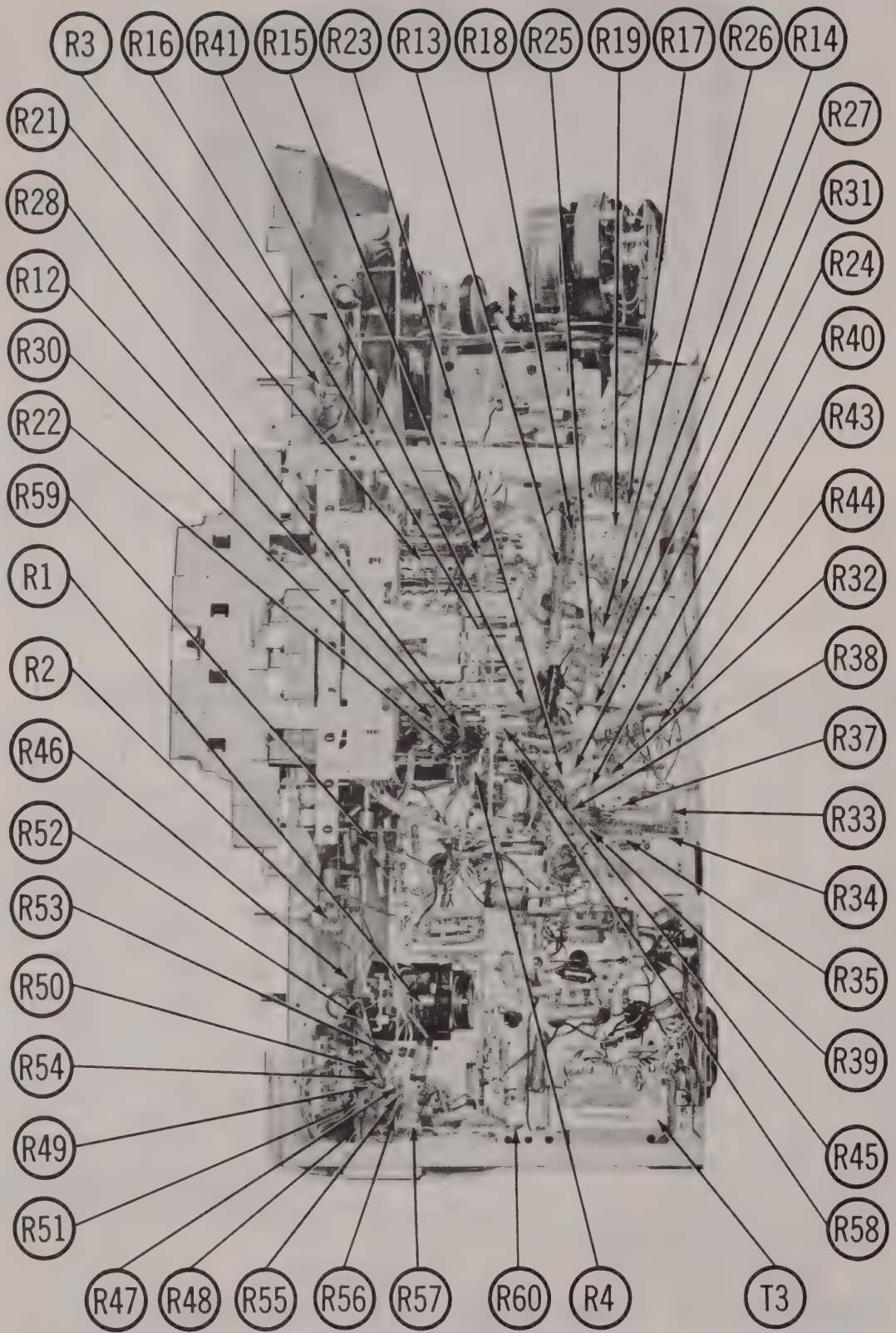
TP TIE POINT

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

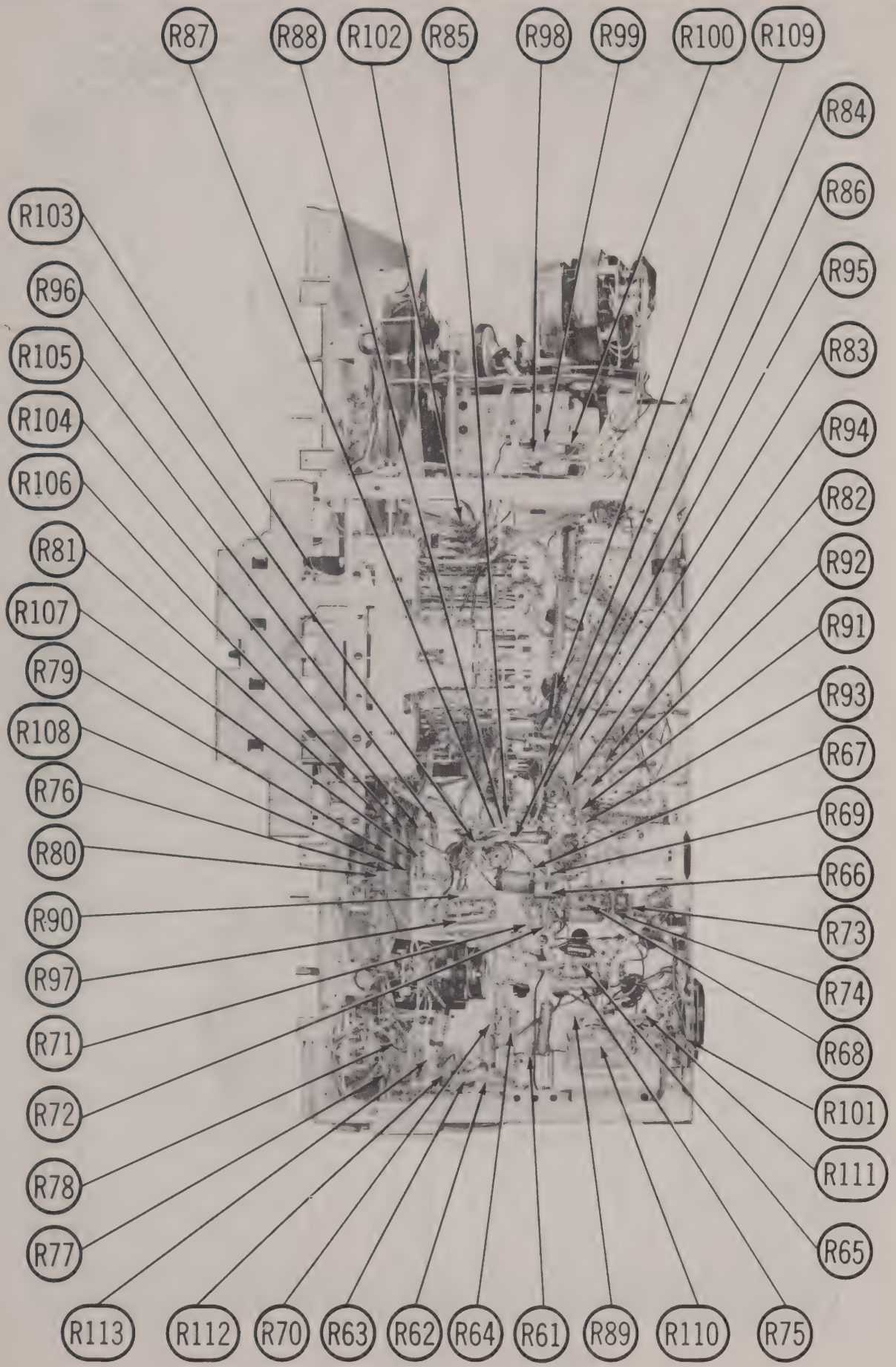
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JM390

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

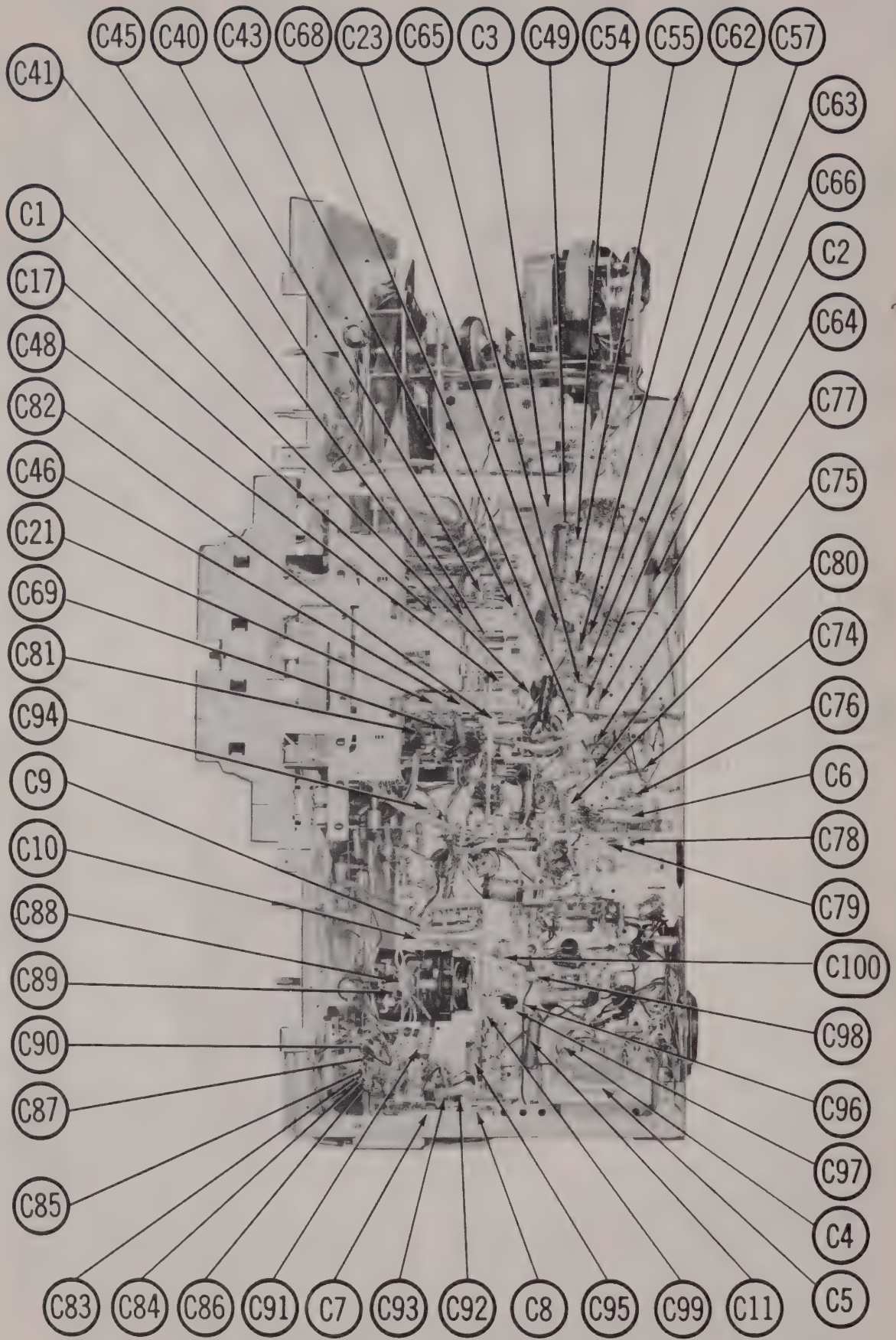
SABA MODEL 400 9T
SABA MODEL 400 9T
SET 468 FOLDER 12



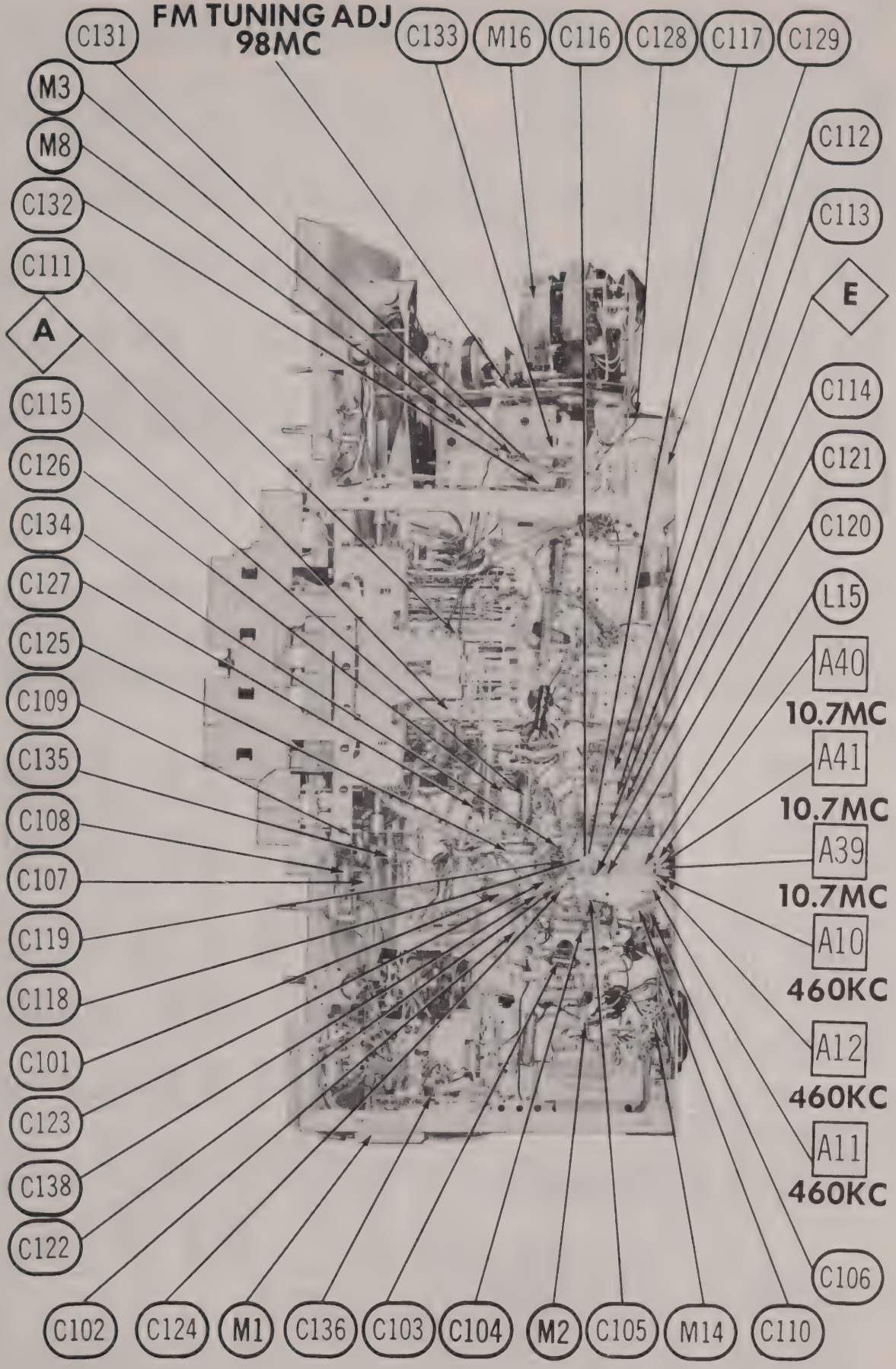
CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R1-R60)



CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R61-R113)



CHASSIS BOTTOM VIEW - CAPACITOR IDENT. (C1-C100)



CHASSIS BOTTOM VIEW
INDUCTOR, MISC., ALIGN., CAPACITOR (C101-C138) IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amplifier	EC92 * 6AB4	V6	AVC Clamper - Trigger Disc. - Trigger Relay Con.	EABC80 * 6T8
V2	FM Converter	EC92 * 6AB4	V7	Tuning Indicator	EM84
V3	1st FM IF Amplifier - AM Mixer - Osc.	ECH81 * 6AJ8	V8	AF Amplifier	EF86 * 6267
V4	2nd FM IF Amplifier - 1st AM IF Amplifier	EF89 * 6DA6	V9	Phase Inverter	EC92 * 6AB4
V5	3rd FM IF Amplifier - 2nd AM IF Amplifier - AM Det. - AVC Det.	EBF89	V10	Output	EL84 * 6BQ5
			V11	Output	EL84 * 6BQ5
			V12	Trigger IF Amplifier - Trigger Amplifier	ECL80

CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

* American Replacements.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SABA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	350	3257036000	PRS2430	BBRD4445	TCD78	TDLD-32	R2462	
B	50	350							
C2	32	350	3252018000	PRS1660	BR3035	TC77	TD-3-350	TVA-1610	
C3	16	350	3252046000	PRS1635	BR1635	TC64	TD-16-350	TVA-1607	
C4	50	30	3251126000	PRS1350	BR505	TC39	TD-50-50	TE-1307	
C5	50	12	3251116000	SRE12V50	BBR50-25	TT15X50	TD-50-25	TE-1133	
C6	5	70	3251193000	SRE150V50	NLW5-100	TT150X5	TD-8-150	TE-1404	
C7	2	350	3252113000	PRS1705	BR245	TT350X2	TD-2-450	TVA-1701	
C8	2	350	3252113000	PRS1705	BR245	TT350X2	TD-2-450	TVA-1701	
C9	2	350	3252113000	PRS1705	BR245	TT350X2	TD-2-450	TVA-1701	
C10	2	350	3252113000	PRS1705	BR245	TT350X2	TD-2-450	TVA-1701	
C11	100	12	3251117000	SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1135	
C12	10	100NP	3251244000	PRS7555	NLW20-100†	TCN511		TVAS-1333*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C13	.0047 500V 10%		V84C6D47 10%		PM6D47	6DP-1-472	JL-247	6TM-D47
C14	47 N750		N750-SI 47	TCN-47	C10Q47C	CCTN-470	CN7-447	10TCU-Q47
C15	14 ±.5mmf		NPO-SI 15	TCZ-15		CCTO-150		
C16	.000027 125V 2.7%			TCZ-27		CM-15-E-270G		
C17	.00001 125V 10%			D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C18	4-21	#3234011000						
C19	4-21	#3234011000						
C20	5		SI 5	D6-050	C10V5C	CCTO-050	GP550	10TS-V50
C21	.000022 125V 10%			D6-220	L10Q22	CM-15-C-220G	GP422	10TS-Q22
C22	4-21	#3234011000						
C23	.047 125V 10%		V84C2S47		PM2S47	4DP-3-473		2TM-S47
C24	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C25	1-3			829-4				
C26	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C27								
C28	12 P100	#3201050000						
C29	12 NPO		NPO-SI 12	TCZ-12	C10Q12C	CCTO-120	CNO412	10TCC-Q12
C30								
C31	8 P100	#3201042000						
C32	200 N750		N750-SI 220	TCN-200	C10T2U	CCTN-201	CN7-320	10TCU-T20
C33	22 N150	#3206048000				*		10TCP-Q22
C34	22 N150	#3206048000				*		10TCP-Q22
C35	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C36	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C37	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C38	.000047 125V 2.5%	#3151130000		TCZ-47		CM-15-E-470G		
C39	.00022 125V 2.5%	#3151138000				CM-15-E-221G		
C40	.0047 125V 2.5%	#3155153000				CM-20E-472G		
C41	.000047 125V			D6-470	L10Q47	CCD-470	GP447	5GA-Q47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C42	4-21	#3234011000						
C43	.00047 125V			D6-471	BYA10T47	CCD-471	B-347	5GA-T47
C44	4-21	#3234011000						
C45	.00042 125V 2.5%	#3151232000				CM-15-E-431G		
C46	.000047 125V 5%			TCZ-47	C10Q47C	CM-15-E-470J	CNO-447	10TCC-Q47
C47	4-21	#3234011000						
C48	.00027 125V 2.5%	#3151139000				CM-15-E-271G		
C49	4700 10%		SI 4700	D6-472	BYA10D47M	CCS-472	UC-5247	5HK-D47
C50	.000047 125V 2.5%			TCZ-47		CM-15-E-470G		
C51	.000047 125V 2.5%			TCZ-47		CM-15-E-470G		
C52	.00022 125V 2.5%	#3155137000				CM-15-E-221G		
C53	.00022 125V 2.5%	#3155137000				CM-15-E-221G		
C54	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C55	.0027 125V		P288N-003	D6-272	CUB6D3	6DP-1-272	GEM-623	6TM-D3
C56	.000047 125V			D6-470	L10Q47	CCD-470	GP447	5GA-Q47
C57	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C58	.000039 125V 2.5%			TCZ-39		CM-15-E-390G		
C59	.0001 125V 2.5%			TCZ-100		CM-15-E-101G		
C60	.00022 125V 2.5%	#3155137000				CM-15-E-221G		
C61	.00022 125V 2.5%	#3155137000				CM-15-E-221G		
C62	4700		SI 4700	D6-4700	BYA10D47M	CCD-472	UC-5247	5HK-D47
C63	.0001 125V 10%			D6-101	PM6T1	CM-20B-101K	GP310	10TS-T10
C64	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C65	.00001 125V 10%			D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C66	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C67	.000047 125V			D6-470	L10Q47	CCD-470	GP447	5GA-Q47
C68	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C69	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C70	5 P100	#3201024000						
C71	.000068 125V 2.5%			TCZ-68		CM-15-E-680G		
C72	.0001 125V 2.5%			TCZ-100		CM-15-E-101G		
C73	.00022 125V 2.5%	#3155137000				CM-15-E-221G		
C74	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C75	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C76	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C77	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C78	.00068 125V 10%			D6-681	1R5T68	CCS-681	GP368	10TS-T68
C79	.00047 125V 10%			D6-471	1R5T47	CCS-471	GP347	10TS-T47
C80	.0001 125V			D6-101	PM6T1	CCD-101	GP310	5GA-T10
C81	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S1
C82	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C83	.0047 125V 10%		V84C2D47 10%		PM6D47	CCS-472	JL-247	6TM-D47
C84	.0047 125V 10%		V84C2D47 10%		PM6D47	CCS-472	JL-247	6TM-D47
C85	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C86	.000047 125V 10%			D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C87	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C88	.00022 125V 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C89	.000047 125V 10%			D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C90	.022 125V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C91	.022 125V	#3113001000						
C92	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C93	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C94	.022 250V		P488N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C95	.022 500V		P688N-022		CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C96	.0022 125V		P288N-0022	D6-222	CUB6D22	CCD-222	B-222	6TM-D22
C97	.0001 125V 10%		P288N-0001	D6-101	L10T1	CCD-101	GP310	10TS-T10
C98	.0001 125V 10%		P288N-0001	D6-101	L10T1	CCD-101	GP310	10TS-T10
C99	.00022 125V 10%			D6-221	L10T22	CCD-221	GT322	10TS-T22
C100	.022 250V		P488N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C101	.047 500V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C102	3		NPO-DI 3	DD-3R3	C10V3C	CCTO-3R3	GP533	10TS-V33
C103	.001 500V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D1
C104	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C105	.00022 125V 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C106	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C107	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C108	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C109	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C110	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C111	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C112	10 P100	#3201029000						
C113	5 P100	#3201024000						

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C114	.000056 125V 10%			D6-560	L10Q56	CCD-560	GP456	10TS-Q56
C115	.022 125V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C116	.000022 125V 5%			TCZ-22	C10Q22C	CM-15-C-220J	CNO-422	MS-422
C117	.0001 125V		P288N-0001	D6-101	L10T1	CCD-101	GP310	5GA-T10
C118	.001 125V 2.5%	#3151146000				CM-20E-102G		
C119	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C120	.00047 125V 2.5%	#3151142000				CM-15-E-471G		
C121	.00047 125V 2.5%	#3151142000				CM-15-E-471G		
C122	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C123	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C124	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C125	.1 125V 10%		V84C2P1		PM2P1	2DP-3-104	GEM-201	2TM-P1
C126	.00027 125V			D6-271	L10T27	CCD-271	GP327	5GA-T27
C127	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C128	.3 370V 10%		V84C4P33		PM4P33		GEM4033	5BF-P33
C129	.25 500V 10%		V84C6P22		PM6P25	6DP-5-254	GEM-6025	6TM-P25
C130	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C131	.047 500V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C132	.022 250V		P488N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C133	.0033 125V 10%		V84C4D33		CUB6D33	CCS-332	GEM-16233	6TM-D33
C134	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C135	.1 125V 10%		V84C2P1		PM2P1	2DP-3-104	GEM-201	2TM-P1
C136	.1 125V 10%		V84C2P1		PM2P1	2DP-3-104	GEM-201	2TM-P1
C137	.022 500V		P688N-022		CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C138	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C139	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C140	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C141	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C142	.1 125V 10%		V84C2P1		PM2P1	2DP-3-104	GEM-201	2WF-P10
C143	.0027 125V 10%				PM6D3	CCS-272	GEM-1623	5BF-D27

Saba Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SABA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1.3meg		5806000564					Volume, Taps @ 100K, 550K,
R2A	5meg		5806000584					Bass 850K
B	500K							Bass
R3A	500K		5806000574					Treble
B	1000Ω							Bandwidth
R4	1.5meg		3373059000					Bias

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100Ω 1W	
R6	470K 1W	
R7	27K 1W	
R8	1meg 1W	
R9	12K	
R10	470K	
R11	180K 2W	
R12	220K 1W	
R13	27K 2W	
R14	47K 1W	
R15	180Ω 1W	
R16	33Ω	
R17	47K	
R18	33K	
R19	3300Ω	
R20	180K	
R21	150K	
R22	3.3meg	
R23	1meg	
R24	10meg	
R25	3300Ω	
R26	82K	
R27	5600Ω 1W	
R28	1meg 1W	
R29	100K	
R30	3.3meg	
R31	150K	
R32	3300Ω	
R33	1000Ω	
R34	4700Ω	
R35	15K	
R36	270Ω 1W	
R37	100K	
R38	2.7meg	
R39	220K	
R40	100K	
R41	100K	
R42	470K	
R43	47K	
R44	100K	
R45	2.2meg	
R46	390K	
R47	47K	
R48	150K	
R49	150K	
R50	82K	
R51	1meg	
R52	48K 2%	(47K) *
R53	15K	
R54	470K 1W	
R55	2.2meg 1W	
R56	1meg	
R57	1meg	
R58	2.2meg	
R59	5.6meg	
R60	220K	
R61	22K	
R62	680K	
R63	470K	
R64	100K	
R65	470K	
R66	1meg	
R67	330Ω 1W	
R68	22K	
R69	470Ω	
R70	22K	
R71	1000Ω	
R72	1meg	
R73	1meg	
R74	1000Ω	
R75	120Ω 1W	
R76	50K	
R77	22Ω	
R78	33Ω	
R79	3900Ω	
R80	330Ω	
R81	1500Ω	
R82	1meg 1W	
R83	1meg 1W	
R84	150K	
R85	1meg	
R86	1meg 1W	
R87	2.2meg 1W	
R88	2.2meg 1W	
R89	1000Ω	
R90	22K 1W	
R91	100K 1W	
R92	220K 1W	
R93	220K 1W	
R94	100K 1W	
R95	100K 1W	
R96	1meg	
R97	47K	
R98	100K	
R99	1meg	
R100	1meg	
R101	10K	
R102	10K 2W	
R103	220K	
R104	47K	
R105	47K	
R106	10K	
R107	47K	
R108	47K	
R109	470Ω 2W	
R110	27K 1W	
R111	27K 1W	
R112	470K 1W	
R113	100K 1W	
R114	50K 1W	
R115	10K 1W	
R116	50K	
R117	250K 1W	
R118	50K 1W	
R119	50K 1W	
R120	250K 1W	
R121	10K	

* Alternate

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SABA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke							
L2	LW Antenna Coil	5806066004						
L3	Loopstick	3882001111						
L4	SW Antenna Coil	5803066004						
L5	LW Antenna Trans.							
L6	AM Antenna Trans.							
L7	SW Antenna Trans.							
L8	LW Osc. Coil							
L9	AM Osc. Coil							
L10	SW Osc. Coil							
L11	1st FM IF Trans.	5806930003						
L12A	2nd FM IF Trans.	5806410002						
B	1st AM IF Trans.							
L13A	3rd FM IF Trans.	5806420002						
B	2nd AM IF Trans.							
L14A	Ratio Detector	5806430002						
B	3rd AM IF Trans.							
L15A	FM Trigger IF Trans.	5806440002						
B	AM Trigger IF Trans.							
C	Trigger Discriminator							
L16	Fil. Choke		19-1000	19-1000	BC-561	4602		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L17	.120A	170Ω	3.4 Hy.	5890205004	26C88 ①		F-806 ①	C-2303 ①	26C88 ①	

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA						
	PRIMARY				SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap @ 150V, 125V, 117V @ .8A				5806301003						
	SEC. 1	SEC. 2	SEC. 3								
	250V @ .170A	35VCT @ .8A	6.3V @ 5.5A								

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (RELAY)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	220V Tap ② 117V ② .050A	21V ② .210A		5890201004						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.1	SEC.1	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	4000Ω Screen Tap ② 1200Ω	2-4Ω SEC. 2 200Ω	5806023004							
	PRI. 2 4000Ω Screen Tap ② 1200Ω	SEC. 3 200Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SABA PART No.	QUAM PART No.	
SP1	9½" x14"	PM	4-5Ω	5898710001		
SP2	8"	PM	4-5Ω	5898420002		
SP3	8"	PM	4-5Ω	5898420002		
SP4	5" x 7'	PM	3-4Ω	5898210002		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	SABA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.170A	B250C150 ①					① Selenium Type
M2	.001A	E52C5 ①					
M3		E625C5 ①					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SABA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4		1. 5A ① 250V S/B .5A ② 250V S/B						

① Used when AC supply is 110-150V. ② Used when AC supply is 220V.

CRYSTAL DIODES

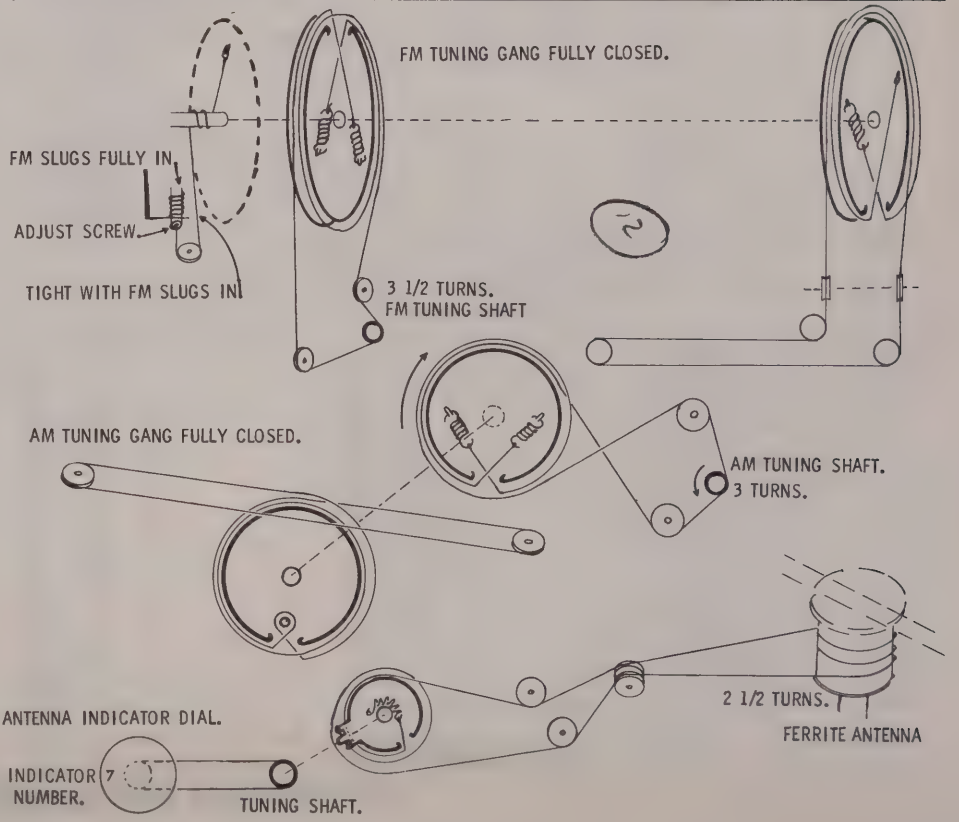
ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SABA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M5		RL232	1N60	1N60	1N295	Ratio Det. (Pigtail)
M6		RL232	1N60	1N60	1N295	Ratio Det. (Pigtail)

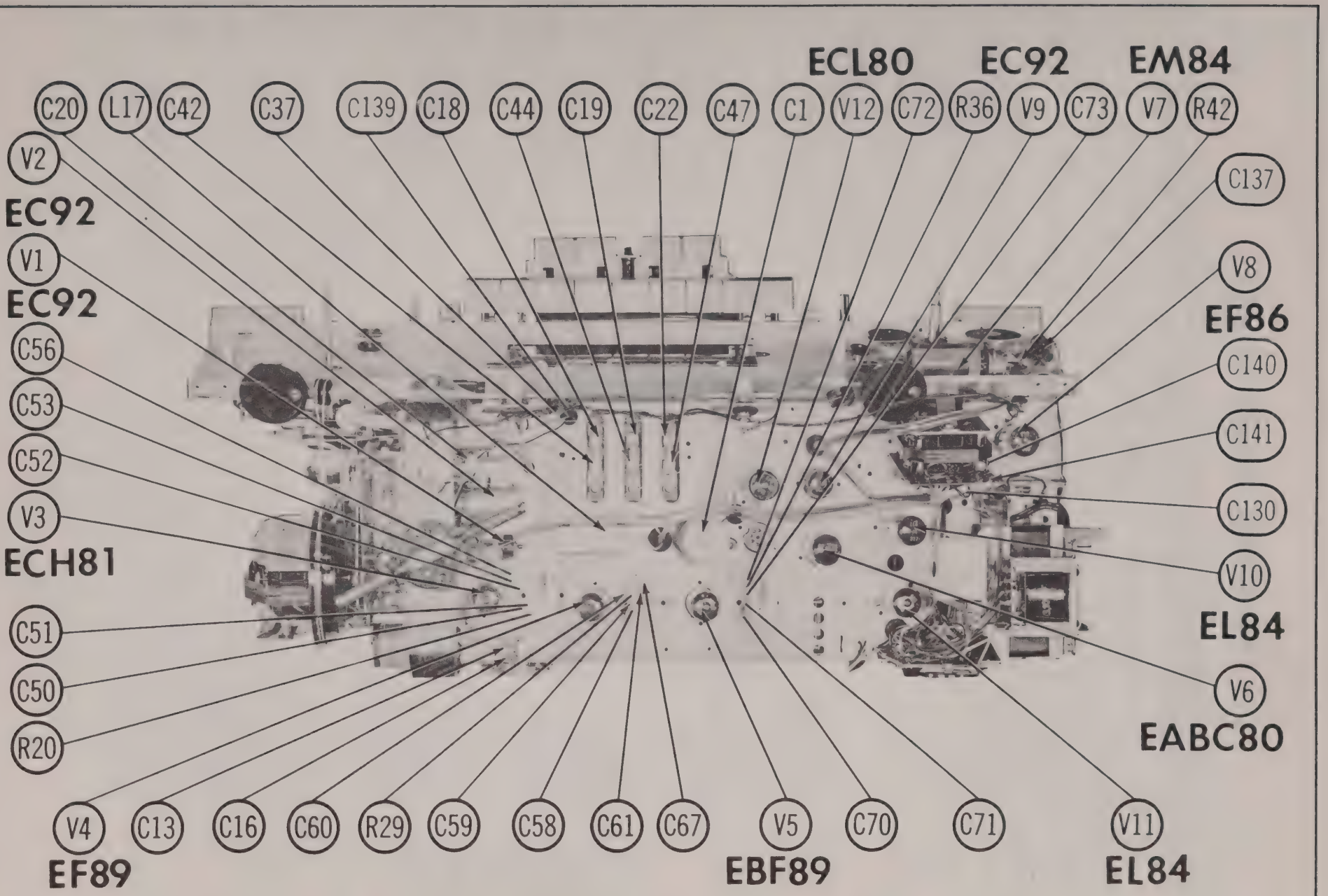
MISCELLANEOUS

ITEM No.	PART NAME	SABA PART No.	NOTES
M7	RF Tuner	5806900002	Complete, Less Tubes
M8	Tuning Cap.	5896100002	2 Gang
M9	Switch Ass'y.	5806501002	Pushbutton, Complete, Includes Music, Off-On, Phono-Tape, LW, AM, SW, FM, Auto-Off, Speech & Music-Speech Solenoid
M10	Switch Ass'y.		Complete, Includes Automatic Tuning & Solenoid
M11	Switch Ass'y.		Remote Control Complete, Includes Off-On, Music, Speech, Volume & Tuning
M12	Switch	5895100004	Speaker
M13	Switch	5806081003	Antenna
M14	Switch	5806031003	Interlock (On Remote Socket)
M15	Switch		AC Input Selection
M16	Motor		Power Tuning
M17	Motor		Volume Control Motor

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)





CHASSIS TOP VIEW - CAPACITOR, RESISTOR, INDUCTOR, TUBE IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1 thru A15 and A27 thru A43 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A16 thru A26 and A44 thru A47 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM IF ALIGNMENT

Connect the negative lead of a 4.5 volts bias supply to point A. Positive to chassis.
Connect speaker during alignment. Set Treble control fully counterclockwise. Depress AM and Automatic-Off buttons.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	10000mmf	High side to pin 1 (screen) of AM Mixer. Low side to chassis.	460KC (400∿ 30% AM)	AM	High frequency end stop	Across voice coil	A1, A2 A3	Detune A3 SLIGHTLY. Adjust A1 and A2 for maximum output. Adjust A3 for maximum, then turn counterclockwise until meter reading decreases 20%.
2.	"	"	"	"	"	"	A4, A5, A6	Detune A6 SLIGHTLY. Adjust A4 and A5 for maximum output. Adjust A6 for maximum, then turn counterclockwise until meter reading decreases 20%.
3.	"	"	"	"	"	"	A7, A8, A9	Detune A9 SLIGHTLY. Adjust A7 and A8 for maximum output. Adjust A9 for maximum, then turn counterclockwise until meter reading decreases 30%.

AUTOMATIC TUNING ALIGNMENT FOR AM

Switch to "Automatic" tuning.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	10000mmf	High side to pin 1 (screen) of AM Mixer. Low side to chassis.	460KC (Unmod.)	AM	High frequency end stop	DC probe to point (B). Common to chassis. Connect a DC microammeter from point (C) to chassis.	A10, A11, A12	Set generator for approximately 12 volts on VTVM. A12 is adjusted at factory. (Do not adjust). Adjust A10 for maximum reading on VTVM. Adjust A11 for zero reading on microammeter. A positive and negative reading will be obtained on either side of correct setting. Repeat.

AM IF TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5.	200mmf and 400Ω in series	Across AM antenna plug with 200mmf and 400Ω in series with high side.	460KC (400∿ 30% AM)	LW	High frequency end stop	Across voice coil.	A13	Adjust for MINIMUM output.

AM RF ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
6.	Direct	High side to AM antenna term. (Rotary Ant. to AUS)	7.2MC (400∿ Mod.)	SW	7.2MC	Across voice coil	A14, A15	Adjust for maximum output.
7.		"	15.2MC	"	15.2MC	"	A16, A17	Adjust for maximum output. Repeat steps 6 and 7 if necessary.
8.		Loop (Rotary Antenna on.)	570KC (400∿ Mod.)	AM	570KC	"	A18, A19	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
9.		"	1520KC	"	1520KC	"	A20, A21	Adjust for maximum output. Repeat steps 8 and 9 if necessary.
10.	Direct	High side to AM antenna term. (Rotary Ant. to AUS)	570KC	"	570KC	"	A22	Adjust for maximum output.
11.	"	"	190KC	LW	190KC	"	A23, A24	"
12.	"	"	300KC	"	300KC	"	A25, A26	Adjust for maximum output. Repeat steps 11 and 12 if necessary.

ALIGNMENT INSTRUCTIONS (cont)

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Press "Automatic Off" Switch.
Connect two matched 100K (±1%) resistors in series from point Ⓓ to chassis. The junction of these two resistors is alignment point Ⓕ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
13.	1000mfd Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	10.7MC (Unmod.)	FM	92MC	DC probe to point Ⓓ. Common to chassis.	A27	Detune A29 by tuning counterclockwise. Adjust A27 for maximum deflection.
14.	"	"	"	"	"	DC probe to point Ⓔ. Common to point Ⓕ.	A28	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
15.	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A29	Adjust for maximum deflection.
16.	"	"	"	"	"	"	A30, A31, A32	The third adjustment number for each IF coil is the coupling adjustment. Detune coupling by turning counterclockwise. Peak all three adjustments in numerical order for maximum deflection.
17.	"	"	"	"	"	"	A33, A34, A35	"
18.	"	"	"	"	"	"	A36, A37, A38	"
19.	"	"	"	"	"	"		Readjust A32 clockwise for MINIMUM deflection.. Voltage should be approximately 10V. Repeat steps 13 and 14.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
13.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	10.7MC (450KC Swp.)	FM	Point of non-interference	Vert. Amp. to point Ⓓ. Low side to chassis.	A27	Disconnect stabilizing capacitor C6. Detune A29 by turning counterclockwise. Adjust A27 for maximum amplitude and symmetry of response similar to Fig. 1. Reconnect C6.
14.	"	"	"	"	"	Vert. Amp. to point Ⓔ. Low side to chassis.	A28	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A27 for maximum amplitude and straightness of crossover lines.
15.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A29	Disconnect C6. Adjust for maximum amplitude and symmetry of response similar to Fig. 1.
16.	"	"	"	"	"	"	A30, A31, A32	The third adjustment number for each IF coil is the coupling adjustment. Detune coupling by turning counterclockwise. Then adjust all three in numerical order for maximum gain and symmetry of response.
17.	"	"	"	"	"	"	A33, A34, A35	"
18.	"	"	"	"	"	"	A36, A37, A38	"
19.	"	"	"	"	"	"		Readjust A32 for MINIMUM response. Repeat steps 13 and 14. Reconnect C6.

AUTOMATIC TUNING ALIGNMENT FOR FM

Switch to "Automatic" tuning.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
20.	10000mmf	High side to pin 6 (grid) of FM Converter. Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓑ. Common to chassis. Connect a DC microammeter from point Ⓒ to chassis.	A39, A40, A41	Set generator output for approximately 30V at point Ⓓ. A41 is adjusted at the factory. (Do not adjust). Adjust A39 for maximum deflection on VTVM. Adjust A40 for zero on microammeter. A positive and negative reading will be obtained on either side of correct setting. Repeat.

ALIGNMENT INSTRUCTIONS (cont)

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
21.		Across FM antenna terminals.	88MC (Unmod.)	FM	88MC	DC probe to point Ⓓ. Common to chassis.	A42, A43	Adjust for maximum deflection.
22.		"	98MC	"	98MC	"	FM tuning adjust.	"
23.		"	"	"	"	"	A44, A45	"
24.		"	92MC	"	92MC	"	A46	"
25.		"	93MC	"	93MC	"	A47	Disconnect the plate voltage from the FM RF Amp. Increase signal generator output to approximately .5 MV. Adjust A47 for MINIMUM deflection. Reconnect plate voltage. Repeat steps 21 and 24.

HUM ADJUSTMENT

Turn Volume control fully counterclockwise. Adjust Hum adjustment for MINIMUM hum in speaker(s).

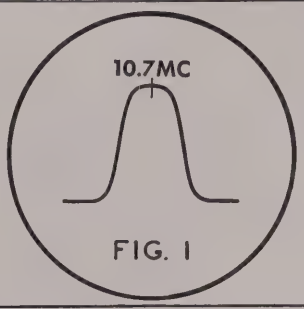


FIG. 1

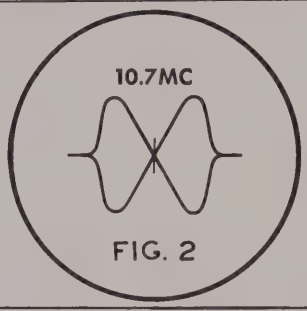
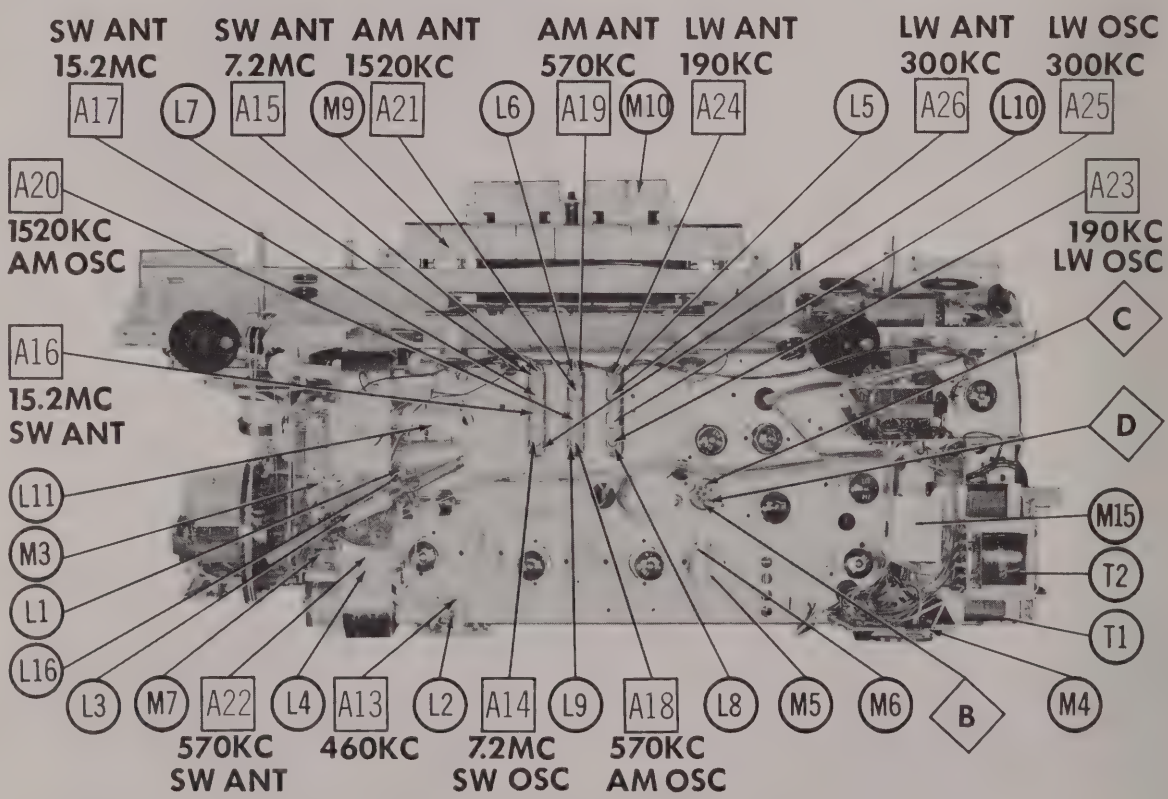
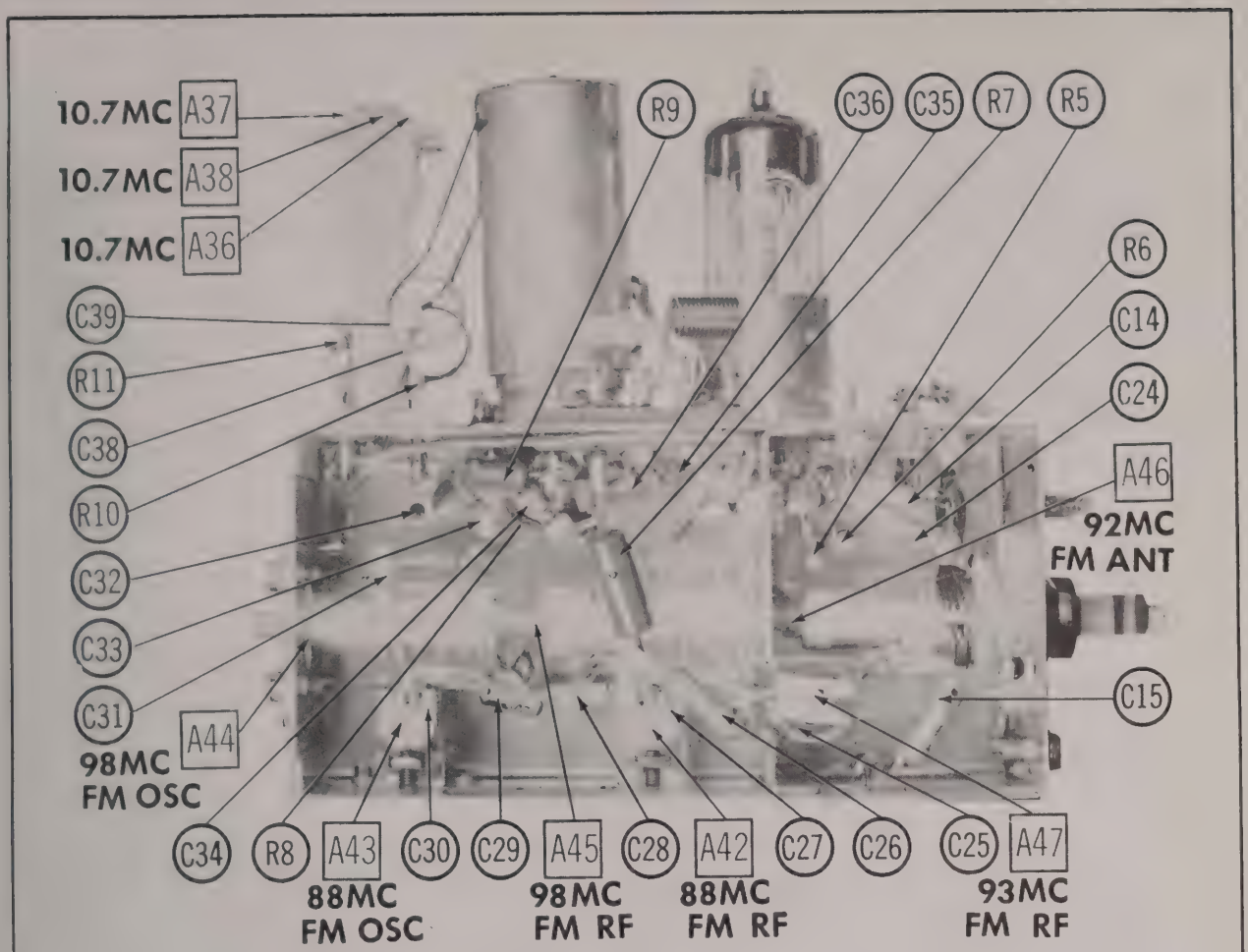


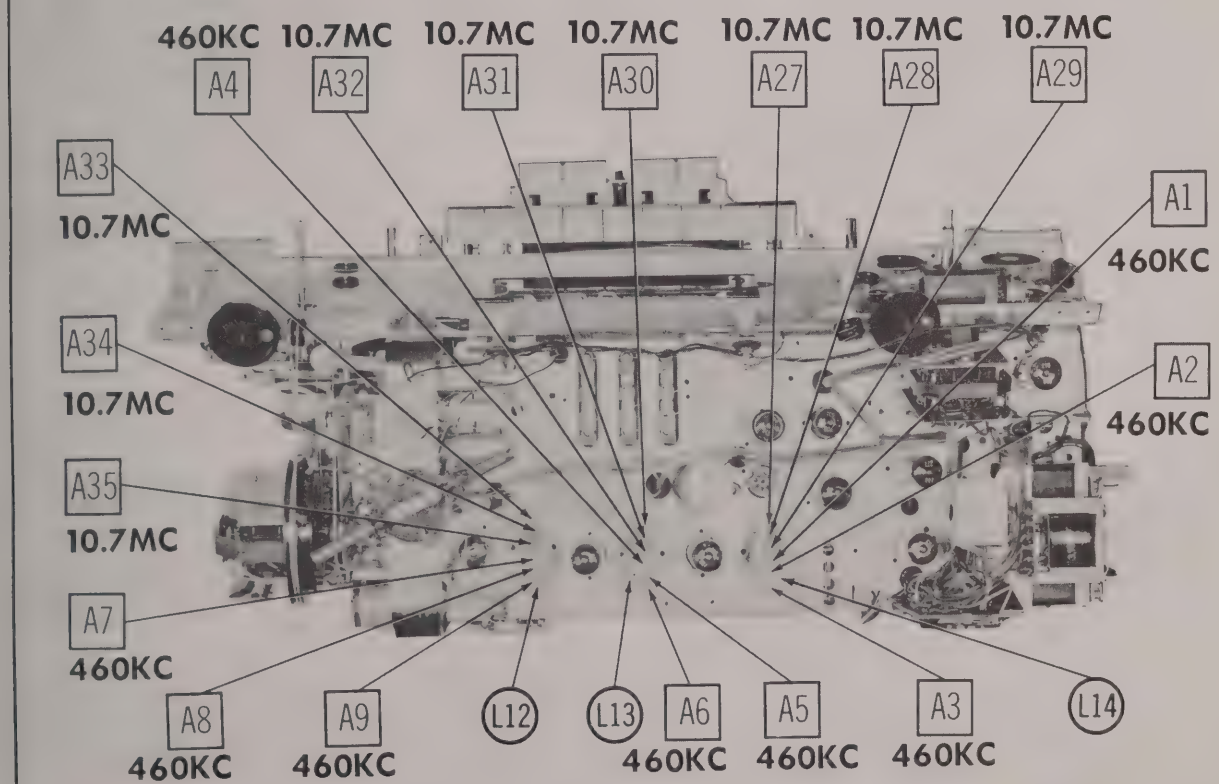
FIG. 2



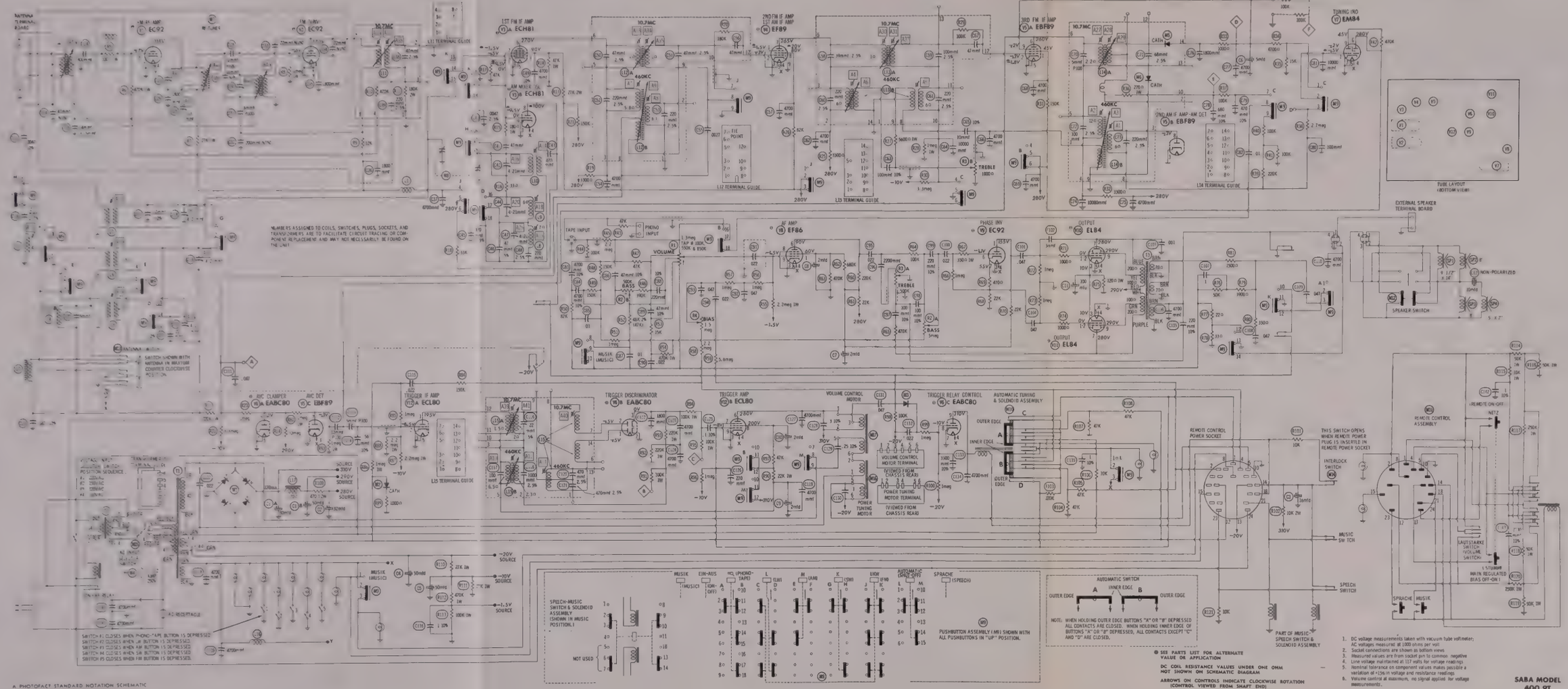
CHASSIS TOP VIEW- MISC., INDUCTOR & ALIGN. IDENTIFICATION



FM, RF SUB CHASSIS



CHASSIS TOP VIEW - ALIGNMENT & INDUCTOR IDENT.


ANTENNA TERMINAL BOARD
1ST AM IF AMP V1 EC92
FM TUNER V2 EC92
10.7MC
L11 TERMINAL GUIDE
1ST FM IF AMP V3a ECH81
AM MIXER V3b ECH81
460KC
L12 TERMINAL GUIDE
2ND FM IF AMP 1ST AM IF AMP V4 EF89
L13 TERMINAL GUIDE
3RD FM IF AMP V5a EBF89
2ND AM IF AMP-AM DET V5b EBF89
TUNING IND V12 EM84
L14 TERMINAL GUIDE
TUBE LAYOUT (BOTTOM VIEW)
EXTERNAL SPEAKER TERMINAL BOARD
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
TAPE INPUT
PHONO INPUT
VOLUME
TAP @ 100K 150K & 850K
AF AMP V8 EF86
BIAS
MUSIK UMUSIC
PHASE INV V9 EC92
OUTPUT V10 EL84
OUTPUT V11 EL84
BASS
TREBLE
BLUE
BLK
PURPLE
SPEAKER SWITCH
NON-POLARIZED
SWITCH SHOWN WITH ANTENNA IN MAXIMUM COUNTER CLOCKWISE POSITION
AVC CLAMPER V13a EABC80
AVC DET V13c EBF89
TRIGGER IF AMP V12a ECL80
TRIGGER DISCRIMINATOR V13b EABC80
TRIGGER AMP V12b ECL80
VOLUME CONTROL MOTOR
VOLUME CONTROL MOTOR TERMINAL
VIEWED FROM CHASSIS REAR
POWER TUNING MOTOR TERMINAL
POWER TUNING MOTOR
TRIGGER RELAY CONTROL V6c EABC80
AUTOMATIC TUNING & SOLENOID ASSEMBLY
OUTER EDGE
INNER EDGE
REMOTE CONTROL POWER SOCKET
REMOTE CONTROL ASSEMBLY
THIS SWITCH OPENS WHEN REMOTE POWER PLUG IS INSERTED IN REMOTE POWER SOCKET
INTERLOCK SWITCH
MUSIC SWITCH
SPEECH SWITCH
LAUTSTARKE SWITCH (VOLUME SWITCH)
SPRACHE
MUSIK
MAIN REGULATED BIAS OFF-ON
SOURCE 330V
290V SOURCE
280V SOURCE
-20V SOURCE
-10V SOURCE
-1.5V SOURCE
SWITCH #1 CLOSES WHEN PHONO-TAPE BUTTON IS DEPRESSED
SWITCH #2 CLOSES WHEN AM BUTTON IS DEPRESSED
SWITCH #4 CLOSES WHEN SW BUTTON IS DEPRESSED
SWITCH #5 CLOSES WHEN FM BUTTON IS DEPRESSED
A-2 RECEPTACLE
SPEECH-MUSIC SWITCH & SOLENOID ASSEMBLY (SHOWN IN MUSIC POSITION.)
NOT USED
MUSIK (MUSIC)
EIN-AUS (ON-OFF)
HCL (PHONO-TAPE)
L (SW1)
M (AM)
K (SW3)
J (FM)
AUTOMATIC SHUT-OFF
SPRACHE (SPEECH)
PUSHBUTTON ASSEMBLY (MI) SHOWN WITH ALL PUSHBUTTONS IN "UP" POSITION.
AUTOMATIC SWITCH
OUTER EDGE
INNER EDGE
NOTE: WHEN HOLDING OUTER EDGE BUTTONS "A" OR "B" DEPRESSED ALL CONTACTS ARE CLOSED. WHEN HOLDING INNER EDGE OF BUTTONS "A" OR "B" DEPRESSED, ALL CONTACTS EXCEPT "C" AND "D" ARE CLOSED.
PART OF MUSIC SPEECH SWITCH & SOLENOID ASSEMBLY
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of +15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
SABA MODEL 400 9T

PHOTOFACT* Folder with CIRCUITRACE*

SONIC MODELS 1001-U, 1003, -U, 1004, -U, 1005, -U, 1010, -U (Ch. 342, S)

SONIC MODELS 1001-U, 1003, -U, 1004, -U, 1005, -U, 1010, -U (Ch. 342, S)

MODEL 1010

SONIC MODELS 1001-U, 1003, -U, 1004, -U, 1005, -U, 1010, -U (Ch. 342, S)

TRADE NAME	Sonic Models 1001-U (Ch. 342), 1003, 1003-U (Ch. 342S), 1004, 1004-U, 1005, 1005-U, 1010, 1010-U(Ch. 342)
MANUFACTURER	Sonic Industries Inc., 19 Wilbur Street, Lynbrook, N. Y.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 35 Watts, .41 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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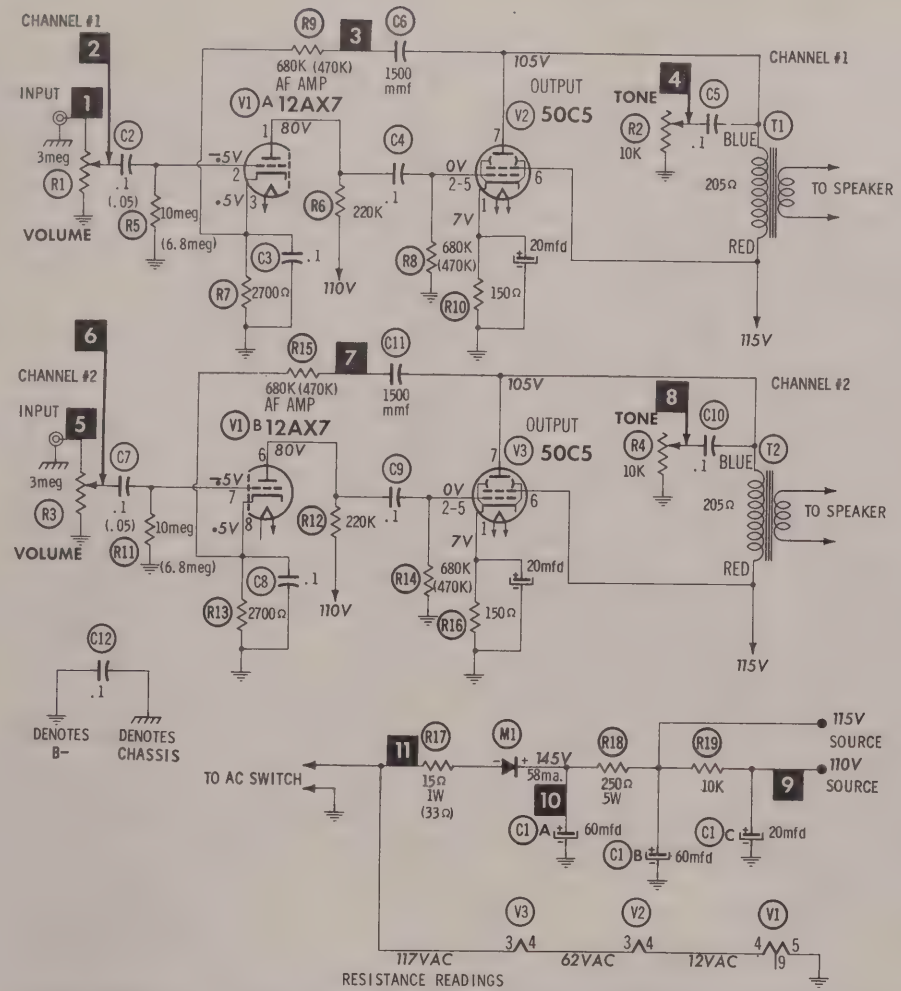
JV588

DATE 12-59 SET 468 FOLDER 13

SET 468 FOLDER 13



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†230K	10meg	2700Ω	12Ω	0Ω	†230K	10meg	2700Ω	6Ω
V2	50C5	150Ω	680K	62Ω	12Ω	680K	†250Ω	†450Ω		
V3	50C5	150Ω	680K	112Ω	62Ω	680K	†250Ω	†450Ω		

† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*

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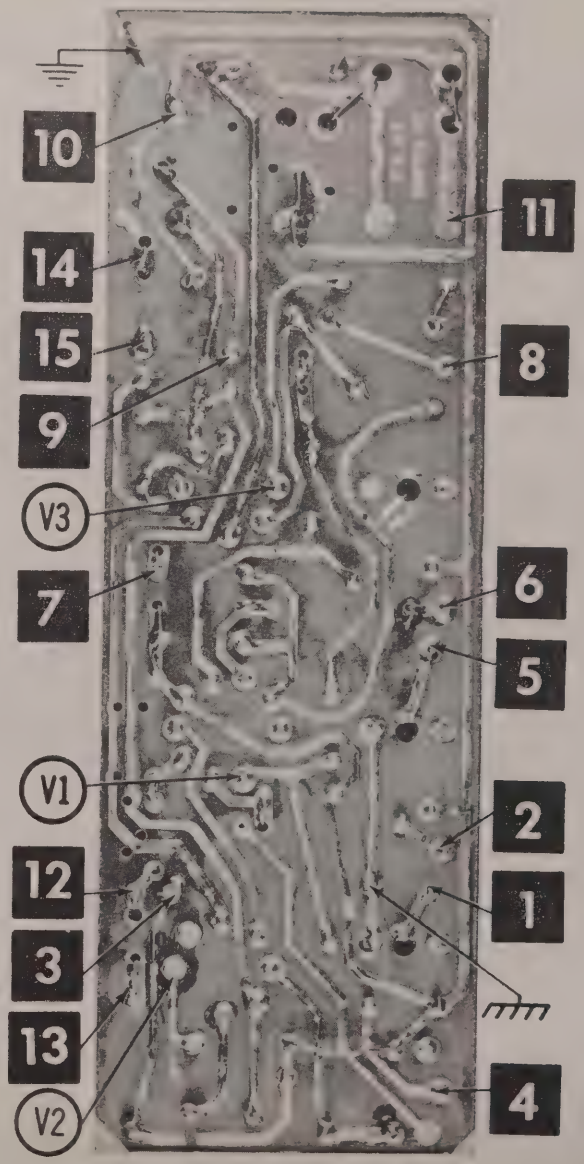
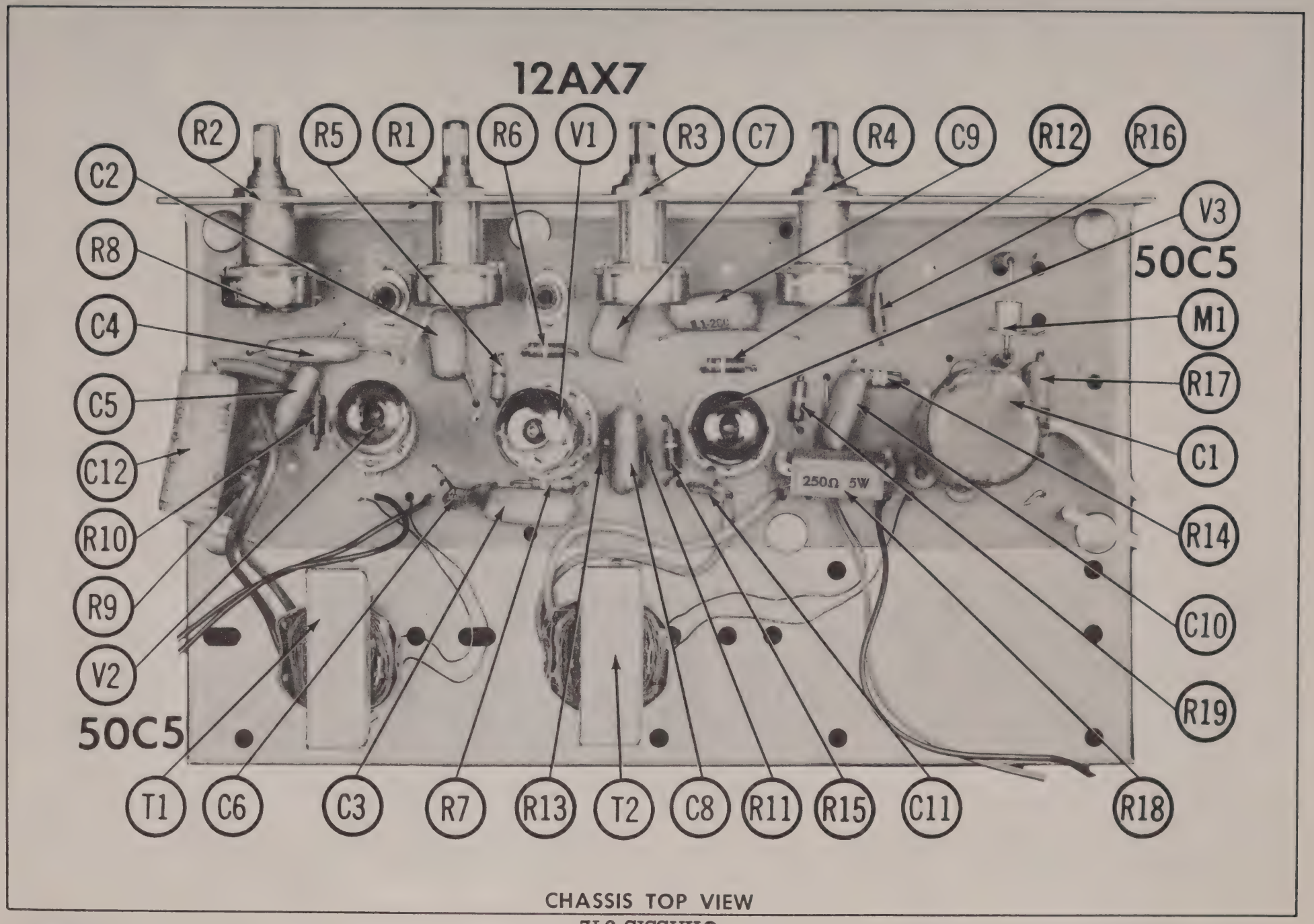
SONIC MODELS 1001-U, 1003, -U, 1004, -U, 1005, -U, 1010, -U (Ch. 342, S)

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PRINTED BOARD





CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V2	Channel 1 Output	50C5
			V3	Channel 2 Output	50C5

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SONIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	6-8Ω	OT342	22S86	A-2902	AU-604	A-3849	22S86	S-3X	
T2	2700Ω	6-8Ω	OT342	22S86	A-2902	AU-604	A-3849	22S86	S-3X	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SONIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	60	150	CE-626	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3445	
B	60	150							
C	20	150							

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SONIC PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.058A	SR-125 ①	5E4 ①	HA154 ①	40K ①	SR200 ①	① Silicon Type

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.1 200V	(.05mfd) *	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C3	.1 200V	Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C4	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C5	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C6	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C7	.1 200V	(.05mfd) *	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C8	.1 200V	Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C9	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C10	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C11	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C12	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

* Alternate
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	3meg	1/2	VC-341					Volume, Channel 1
R2	10K	1/2	TC-341					Tone, Channel 1
R3	3meg	1/2	VC-341					Volume, Channel 2
R4	10K	1/2	TC-341					Tone, Channel 2

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	10meg	(6.8meg) *
R6	220K	
R7	2700Ω	
R8	680K	(470K) *
R9	680K	(470K) *

* Alternate

ITEM No.	RATING	REMARKS
R10	150Ω	
R11	10meg	(6.8meg) *
R12	220K	
R13	2700Ω	
R14	680K	(470K) *

ITEM No.	RATING	REMARKS
R15	680K	(470K) *
R16	150Ω	
R17	15Ω 1W	
R18	250Ω 5W	
R19	10K	

CABINETS & CABINET PARTS

When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

STROMBERG-CARLSON MODEL AR-432

STROMBERG-CARLSON
MODEL AR-432

STROMBERG-CARLSON
MODEL AR-432

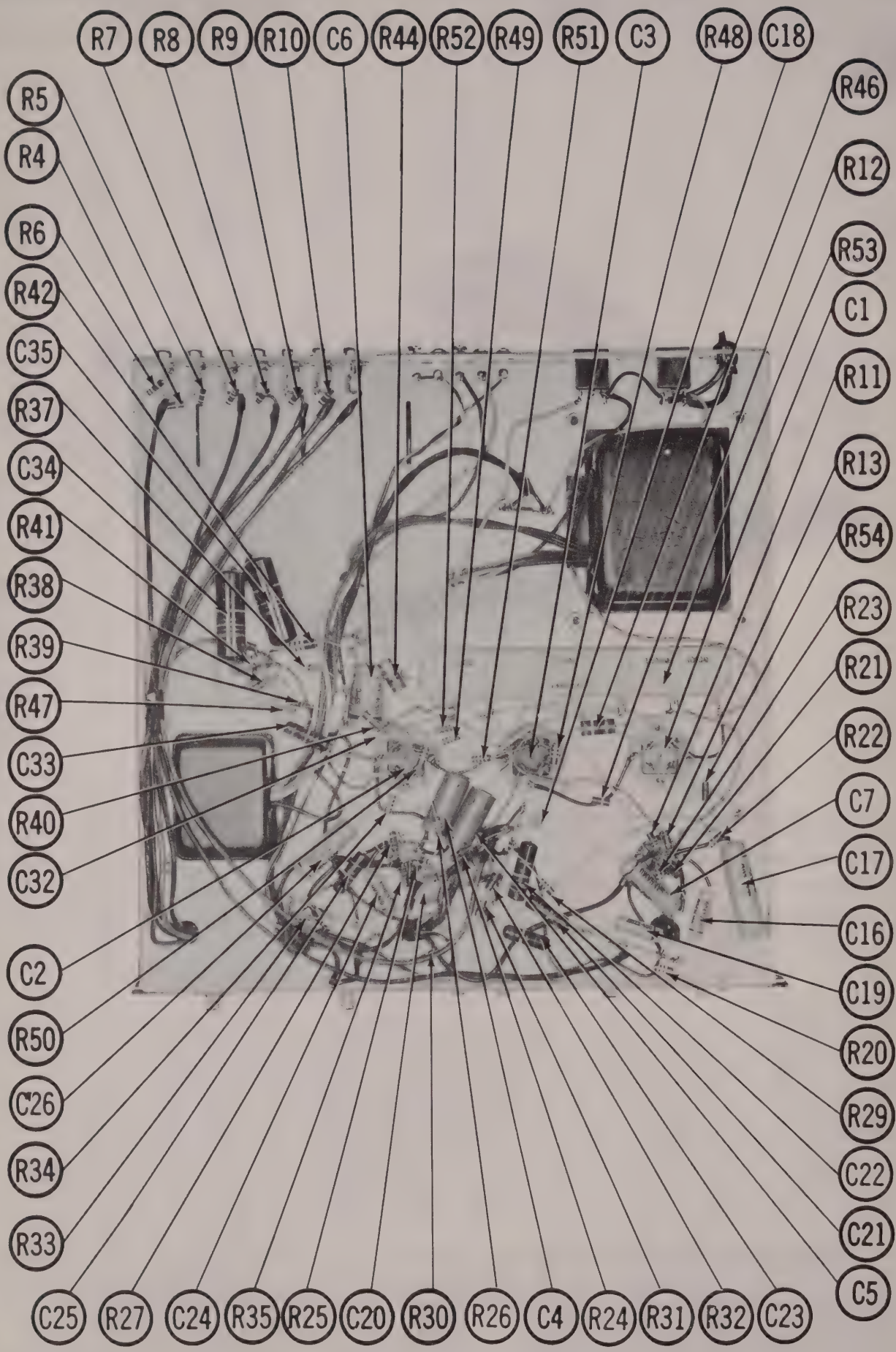
TRADE NAME	Stromberg-Carlson Model AR-432		
MANUFACTURER	Stromberg-Carlson Co., Special Products Div., 1400 N. Goodman St., Rochester 9, N. Y.		
TYPE SET	AC Operated 6 Tube Audio Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	130 Watts, 1.3 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JX391

DATE 12-59



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Phono Preamplifier	7025 (12AX7) *	V4	Output	7027
V2	AF Amplifier	7025 (12AX7) *	V5	Output	7027
V3	AF Amp. - Phase Inverter	6U8	V6	Rectifier	5V4GA

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲30	500	111000-030	AFH2-72	B0510	FP284	TMT-46	TVL-2937	
B	■30	500							
C2A	■20	450	111000-028	AFH4-14	D0130	FP444	TMQ-12	TVL-4763	
B	▲20	450							
C	20	450							
D	▲20	450							
C3A	■30	400	111000-029					TVLS-4804.3*	
B	▲40	450							
C	▲50	50							
D	50	50							
C4	50	6	111615	PRS1265	BBR50-6	TT6X50	TD-50-6	TVA-1100	
C5	50	6	111615	PRS1265	BBR50-6	TT6X50	TD-50-6	TVA-1100	
C6	2	450	111119-000	PRS1705	BR245	TC70	TD-2-450	TVA-1701	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

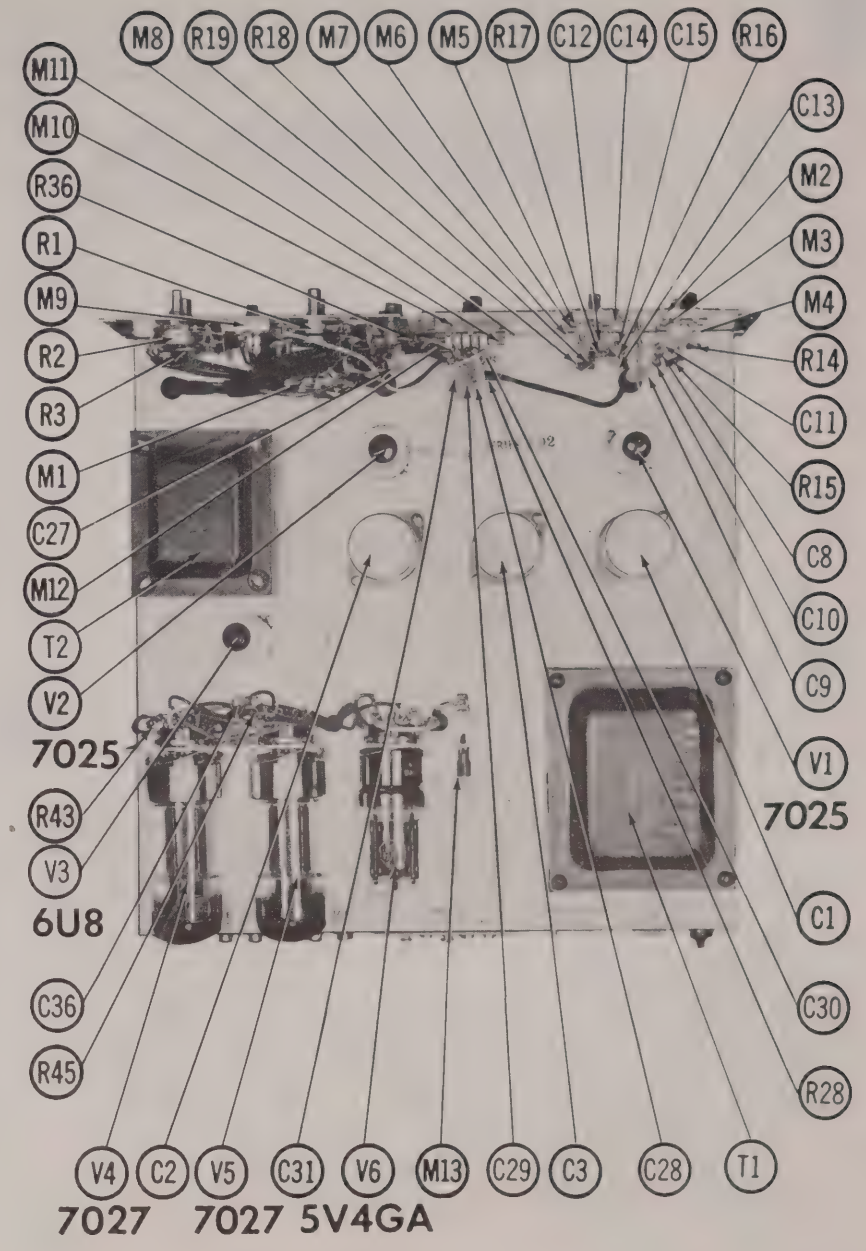
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C8	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C9	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C10	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C11	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C12	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C13	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C14	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C15	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C16	.0047 400V (.047)†		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C17	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C18	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C19	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C20	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C21	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C22	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C23	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C24	.001 400V		P488N-001	D6-102	CUB6D1	6DP-1-102	GEM-421	6TM-D1
C25	.01 200V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-401	4TM-S1
C26	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C27	100 N150					*		10TCP-T10
C28	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C29	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C30	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C31	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C32	100 N150					*		10TCP-T10
C33	.015 200V		P288N-015	DD16-153	CUB4S15	4DP-1-153	GEM-4115	4TM-S15
C34	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C35	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C36	36 1000V 10%		NPO-SI 36	TCZ-36	C10Q36C	CCD-390		10TS-Q39

† Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg 300K tap	½	145000-059	BT-72	A47F-1meg	Q13-137X	UT-438	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	145000-058	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.		
R3A	5 meg	½	145000-057	B-88	A47-5meg-Z	Q13-141	U65	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	220K	
R5	470K	
R6	470K	
R7	470K	
R8	470K	
R9	470K	
R10	470K	
R11	47K	
R12	220K	
R13	8200Ω	
R14	33meg	
R15	33meg	
R16	220K	
R17	33meg	
R18	33meg	
R19	33meg	
R20	470K	(5.6meg) *
R21	1meg	

* Alternate

ITEM No.	RATING	REMARKS
R22	82K	
R23	4700Ω	
R24	1meg	
R25	100K	
R26	47K	
R27	1500Ω	
R28	1meg	
R29	470K	
R30	220K	
R31	1meg	
R32	1meg	
R33	22K	
R34	56K	
R35	1500Ω	
R36	47K	
R37	100K	
R38	1000Ω 5%	
R39	22K	

ITEM No.	RATING	REMARKS
R40	220K	
R41	47K 1W	
R42	47K 1W	
R43	100K	
R44	10K 2W	
R45	100K	
R46	27Ω 2W	
R47	4700Ω	
R48	56K	
R49	56K	
R50	56K	
R51	56K	
R52	1500Ω	
R53A	1500Ω 10W	
B	7500Ω 25W	#149623-000
C	1500Ω 10W	
D	1000Ω 5W	
R54	1meg	(220K) *

Stromberg-Carlson Part Number.

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

TRANSFORMER (POWER)

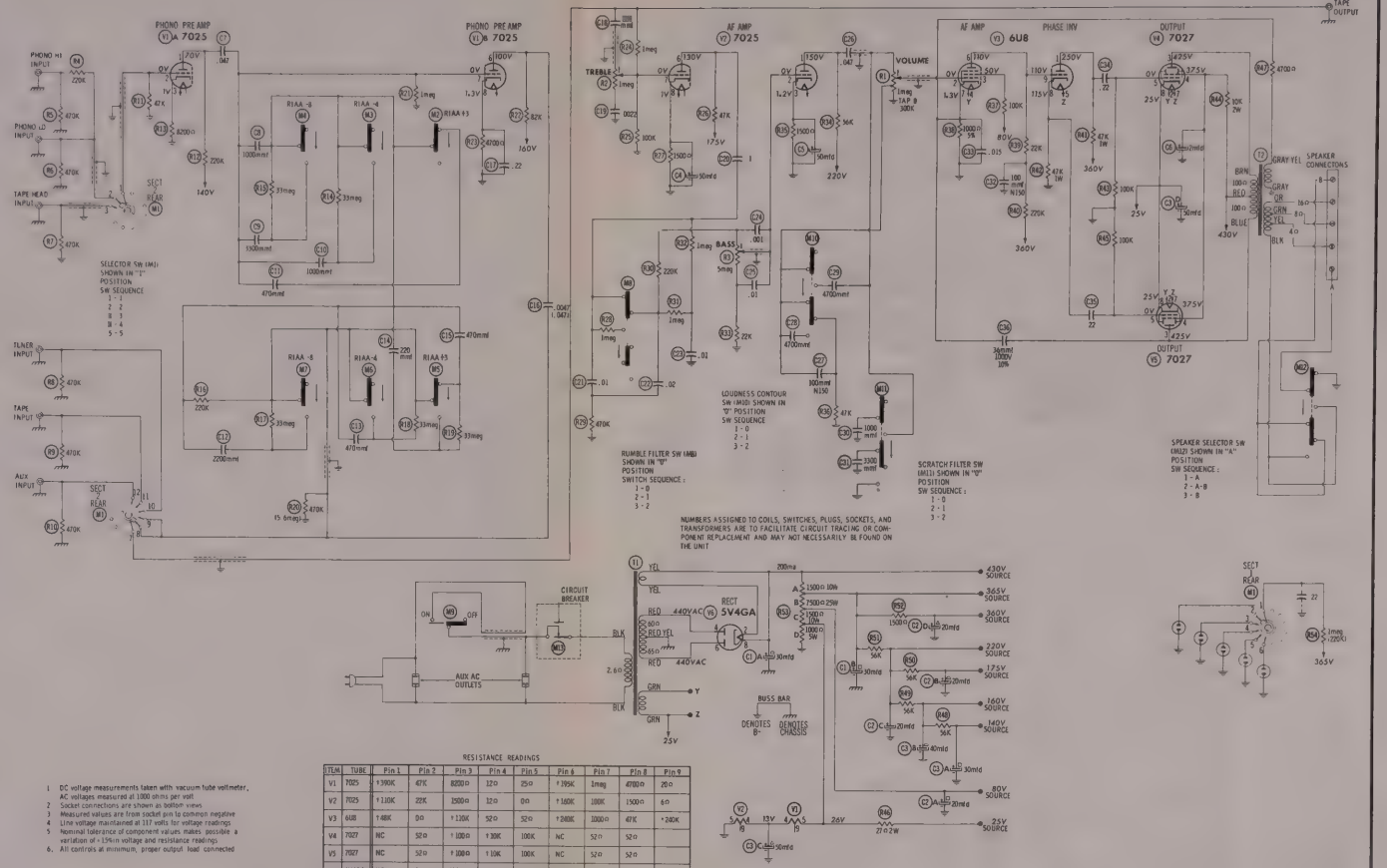
ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.3A	880VCT @ .200A	5V @ 2A	161000-203						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.1	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8000Ω CT	3.2Ω SEC.2 16Ω Tap @ 8Ω, 4Ω	161000-153							

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M1	Switch	158000-022	Function Selector
M2	Switch	158000-032	Compensation (SPDT, Slide Type)
M3	Switch	158000-032	Compensation (SPDT, Slide Type)
M4	Switch	158000-032	Compensation (SPDT, Slide Type)
M5	Switch	158000-032	Compensation (SPDT, Slide Type)
M6	Switch	158000-032	Compensation (SPDT, Slide Type)
M7	Switch	158000-032	Compensation (SPDT, Slide Type)
M8	Switch	158000-047	Rumble Filter (DPDT, Slide Type)
M9	Switch	158000-055	Off-On (SPDT, Slide Type)
M10	Switch	158000-047	Loudness (DPDT, Slide Type)
M11	Switch	158000-047	Scratch Filter (DPDT, Slide Type)
M12	Switch	158000-047	Speaker Selector (DPDT, Slide Type)
M13	Circuit Breaker	128000-026	


PHONO PRE AMP (1/2) A 7025
PHONO PRE AMP (1/2) B 7025
AF AMP (V7) 7025
AF AMP (V3) 6U8
PHASE INV
OUTPUT (V4) 7027
OUTPUT (V5) 7027
TAPE OUTPUT
VOLUME
PHONO HI INPUT
PHONO LO INPUT
TAPE HEAD INPUT
TUNER INPUT
TAPE INPUT
AUX INPUT
SECT REAR
SELECTOR SW (M1) SHOWN IN "I" POSITION SW SEQUENCE 1 - 1 2 - 2 3 - 3 4 - 4 5 - 5
RIAA -8
RIAA -4
RIAA #3
RIAA #5
TREBLE
BASS
LOUDNESS CONTOUR SW (M10) SHOWN IN "0" POSITION SW SEQUENCE 1 - 0 2 - 1 3 - 2
RUMBLE FILTER SW (M9) SHOWN IN "0" POSITION SWITCH SEQUENCE : 1 - 0 2 - 1 3 - 2
SCRATCH FILTER SW (M11) SHOWN IN "0" POSITION SW SEQUENCE : 1 - 0 2 - 1 3 - 2
SPEAKER SELECTOR SW (M12) SHOWN IN "A" POSITION SW SEQUENCE : 1 - A 2 - A-B 3 - B
SPEAKER CONNECTORS
GRAY YEL
BRN
RED
GRY
GRN
YEL
BLUE
BLK
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
CIRCUIT BREAKER
AUX AC OUTLETS
RECT 5V4GA
440VAC
BUSS BAR
DENOTES B+
DENOTES CHASSIS
430V SOURCE
365V SOURCE
360V SOURCE
220V SOURCE
175V SOURCE
160V SOURCE
140V SOURCE
80V SOURCE
25V SOURCE

RESISTANCE READINGS

VTUBE	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†390K	47K	8200Ω	12Ω	25Ω	†795K	1meg	4700Ω	26Ω
V2	7025	†110K	22K	1500Ω	12Ω	0Ω	†160K	100K	1500Ω	6Ω
V3	6U8	†48K	0Ω	†120K	52Ω	52Ω	†240K	1000Ω	47K	†240K
V4	7027	NC	52Ω	†100Ω	†30K	100K	NC	52Ω	52Ω	
V5	7027	NC	52Ω	†100Ω	†10K	100K	NC	52Ω	52Ω	
V6	5V4GA	NC	¶	NC	60Ω	NC	65Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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STROMBERG-CARLSON
MODEL AR-432

PHOTOFACT* Folder

EIA MEMBER

TRUETONE MODELS
DC5940A, B, DC5942A, B, DC5944A, B

TRUETONE MODELS
DC5940A, B, DC5942A, B, DC5944A, B

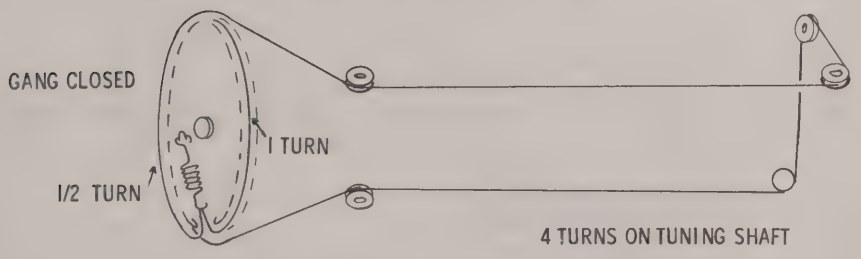
MODEL DC5940A

TRUETONE MODELS
DC5940A, B, DC5942A, B, DC5944A, B

TRADE NAME	Truetone Models DC5940A, B; DC5942A, B; DC5944A, B.		
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Missouri		
TYPE SET	AC Operated 10 Tube FM-AM Tuner & 7 Tube Amplifier With 4 Speed Automatic Record Changer		
POWER SUPPLY	105-125 Volts AC, 60 Cycles	RATING	180 Watts, 1.66 Amp. @ 117 Volts AC (Less Motor)
TUNING RANGE	BROADCAST 540-1600KC	FREQ.MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #28A227 - SEE V-M 1200 - PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JM180R

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CB6	
V2	FM Mixer - FM AFC	12AT7	
V3	FM Oscillator	6AB4	
V4	1st FM IF Amplifier	6AU6	
V5	AM RF Amplifier	6BA6	
V6	AM Converter	6BE6	
V7	2nd FM -1st AM IF Amp.	6BA6	
V8	FM Limiter - AM Det. - AVC	6AU6	

ITEM No.	USE	TYPE	NOTES
V9	Discriminator	6AL5	
V10	AF Amplifier	7025	
V11	AF Amp. - Phase Inv.	12AX7	
V12	Output	EL84/6BQ5	
V13	Output	EL84/6BQ5	
V14	Output	EL84/6BQ5	
V15	Output	EL84/6BQ5	
V16	Rectifier	5Y3GT	
V17	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400	45X450			FP375.4		TVLS-4671.1*	
B	■40	400				TC78			
C	▲40	400							
D	40	200							
C2A	▲20	350	45X452	AFH3-43-50	C0344	FP376.9	TMT-39	TVL-3786	
B	■40	200							
C	▲40	200							
C3	100	25	45X449	PRS25V100	BR1005	TC2501	TD-100-25	TVA-1207	
C4	5	50NP		NP-PRS50V5	BBR8-150 †	TCN504		TVAS-1202.5*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C6	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C7	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C8	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C9	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D1
C10	220		BPD-00022	DD-221	L10T22	CCD-221	B-322	5GA-T22
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C12	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D1
C13	1		NPO-SI 1	TCZ-1			CNO-510	5TCCB-V1
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C15	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C16	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C17	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C18	220		BPD-00022	DD-221	L10T22	CCD-221 *	B-322	5GA-T22
C19	25 N2200	①						
C20	2-9 N750	(#17A273)						
C21	.1 100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C22	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D1
C23	.0022 200V		P288N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C26	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C27	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C28	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470 *	CN7-447	10TCU-Q47
C29	9 N3300							
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C32	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C33	50000 100V		BPD-05	DF-503	CUB2S5	1DP-2-503	BT-150	5HK-S5
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C35	2 N750 ± .25mmf	(#47X628)						
C36	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C37	33 N750 10%		N750-SI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103 *	B-110	5HK-S1
C40	100 N150							

CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C41	680 10%		DI-680	MD-681	1R5T68	CCS-681	JL-368	MS-368
C42	180 10%		DI-180	MD-181	L10T18	CCS-181		MS-318
C43	.047 200V		P288N-047	DF-503	CUB2S47	4DP-3-473	GEM-4147	4TM-S47
C44	.0025 200V		P288N-0025	D6-252	CUB6D25	6DP-1-252	GEM-6225	6TM-D25
C45	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C46	.1 200V		P488N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C47	330		DI-330	MD-331	L10T33	CCD-331	JL-330	M3-333
C48	.0025 200V		P288N-0025	D6-252	CUB6D25	6DP-1-252	GEM-6225	6TM-D25
C49	1500		SI 1500	D6-152	BYA10D15	CCD-152	UC-5215	5HK-D15
C50	.0025 200V		P288N-0025	D6-252	CUB6D25	6DP-1-252	GEM-6225	6TM-D25
C51	1500		SI 1500	D6-152	BYA10D15	CCD-152	UC-5215	5HK-D15
C52	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C53	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCU-Q1
C54	1500		SI 1500	D6-152	BYA10D15	CCD-152	UC-5215	5HK-D15
C55	.047 200V		P288N-047	DF-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C56	1500		SI 1500	D6-152	BYA10D15	CCD-152	UC-5215	5HK-D15
C57	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C58	43 N750 10%			TCN-43		CCTN-470		10TCU-Q43
C59	43 N750 10%			TCN-43		CCTN-470		10TCU-Q43
C60	82 10%		1469-000082	D6-820	22R5Q82	CCD-820	CNO-482	MS-482
C61	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C62	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C63	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C64	680 10%		DI-680	MD-681	1R5T68	CCS-681	JL-368	10TS-T68
C65	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	36X406 ①	BT-7417	A47F3-1meg	Q18-137X	RU16T15 *	Level, Tap ② 100K
B	Shaft			Not Req.	FS-3	Not Req.	SL3500	
R2	2meg	½	36X405	BT-175		Q13-139XX	UDT-296	Contour, Taps ② 650K,
R3A	500K	½	40X451	B-60	A47-500K-Z	Q13-133	U48	Treble 1.5meg
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	40X450	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	400Ω	1(WW)	40X452	WN-401	A43-400	W11-202	R500L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	WM Kit	Not Req.	

① Some versions may use Part #36X404. * Use SL-38 bushing.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	NOTES
R6	2.2meg			
R7	10K			
R8	1meg			
R9	47K			
R10	22K			
R11	220Ω			
R12	680Ω			
R13	1000Ω			
R14	33Ω			
R15	470K			
R16	470K			
R17	15K	1		
R18	220Ω			
R19	1meg			
R20	4700Ω			
R21	3.3meg			
R22	68K			
R23	100Ω			
R24	12K			
R25	33Ω			

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	NOTES
R26	39K			
R27	6800Ω			
R28	4700Ω			
R29	330Ω			
R30	68Ω			
R31	100K			
R32	2.2meg			
R33	100K			
R34	15K		B85153	
R35	15K		B85153	
R36	100K 5%			
R37	100K 5%			
R38	100K 5%			
R39	470K			
R40	1meg 5%			
R41	220K			
R42	100K			
R43	560Ω			
R44	180K			
R45	470K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	TRUETONE PART No.	NOTES
R46	33K			
R47	220K			
R48	470K			
R49	220K			
R50	100K			
R51	2.2meg			
R52	47K			
R53	3300Ω			
R54	1000Ω			
R55	2.7meg			
R56	2.7meg			
R57	1meg			
R58	330K			
R59	560Ω			
R60	180K			
R61	1meg			
R62	82K			
R63	100K			
R64	2200Ω			
R65	82K			
R66	100K			
R67	100Ω			
R68	100Ω			
R69	100Ω			
R70	56Ω	1	C84560	
R71	65Ω	5	43X309	
R72	100Ω			
R73	56Ω	1	C84560	
R74	6800Ω			
R75	68Ω			
R76	1000Ω	1		
R77	330Ω	1		
R78	4700Ω			
R79	10K	2		
R80	680Ω	4		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	12A561	12A6A	
SP2	12"	PM	6-8Ω	12A562	12A6A	
SP3	5"	PM	3-4Ω	12A563	5A1	
SP4	5"	PM	3-4Ω	12A563	5A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	3DX5369 ①	89TX	Not Req.	86-T †	Not Req.			3T-S	Not Req.
	3DX5391 ②	13TX	Not Req.	66 †	Not Req.			8TA	Not Req.

① Monaural versions. Includes needles. ② Stereo versions. Includes needles. † Use PT-3 mounting.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA TRUETONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	9A2448	19-1000	19-1000	BC-561	4602		
L2	RF Choke	35A8						3.3uh ①
L3	FM RF Plate Coil	9A2445						
L4	FM RF Grid Coil	9A2446						
L5	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L6	FM Osc. Coil	9A2447						
L7	RF Choke	35A8						3.3uh ①
L8	Loopstick	9A2441						
L9	AM RF Coil	9A2439						Tapped @ 6.4Ω
L10	AM Osc. Coil	9A2438						Tapped @ .3Ω
L11	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L12	1st FM IF Trans.	9A2440	16-3487	16-3487	FM-254	1463		
L13	1st AM IF Trans.	9A2443	16-6758	16-6758	BC-352	12-C1	RF-1	
L14	2nd FM IF Trans.	9A2440	16-3487	16-3487	FM-254	1463		
L15	2nd FM IF Trans.	9A2443	16-6758	16-6758	BC-353	12-C2	RF-2	
L16	3rd FM IF Trans.	9A2440	16-3487	16-3487	FM-254	1463		
L17	Fil. Choke	35A6	19-1001	19-1001	BC-562	4604		1.5uh ①
L18	Discriminator	9A2442	17-3494	17-3494	FM-253	1464		

① IRC Part #CLA.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M2	3DX5369 ①	W205DS † ♦ ①		† Jewel ♦ Diamond * Metal
	3DX5391 ②	W204DS † ♦ ②		① Monaural versions. Includes cartridge. ② Stereo versions. Includes cartridge.

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Tuning Cap.	14A235	6 Gang (AM Sections: Ant. 13-332mmf, RF 12-217mmf, Osc. 10-143mmf)
M4	Switch	2A493	Function
M5	Switch	2A492	Speaker Off-On

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.66A	620VCT @ .190A Tap @ 280VCT @ .038A	5V @ 3A	53X371 ①						
	SEC. 3	SEC. 4	SEC. 5							
	5V @ 2A	12V @ 1.8A	6.3V @ 3.1A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	3000Ω CT	3-4Ω	51X194	22S72 *				22S72 *	S-33A *	* Drill new mounting holes.

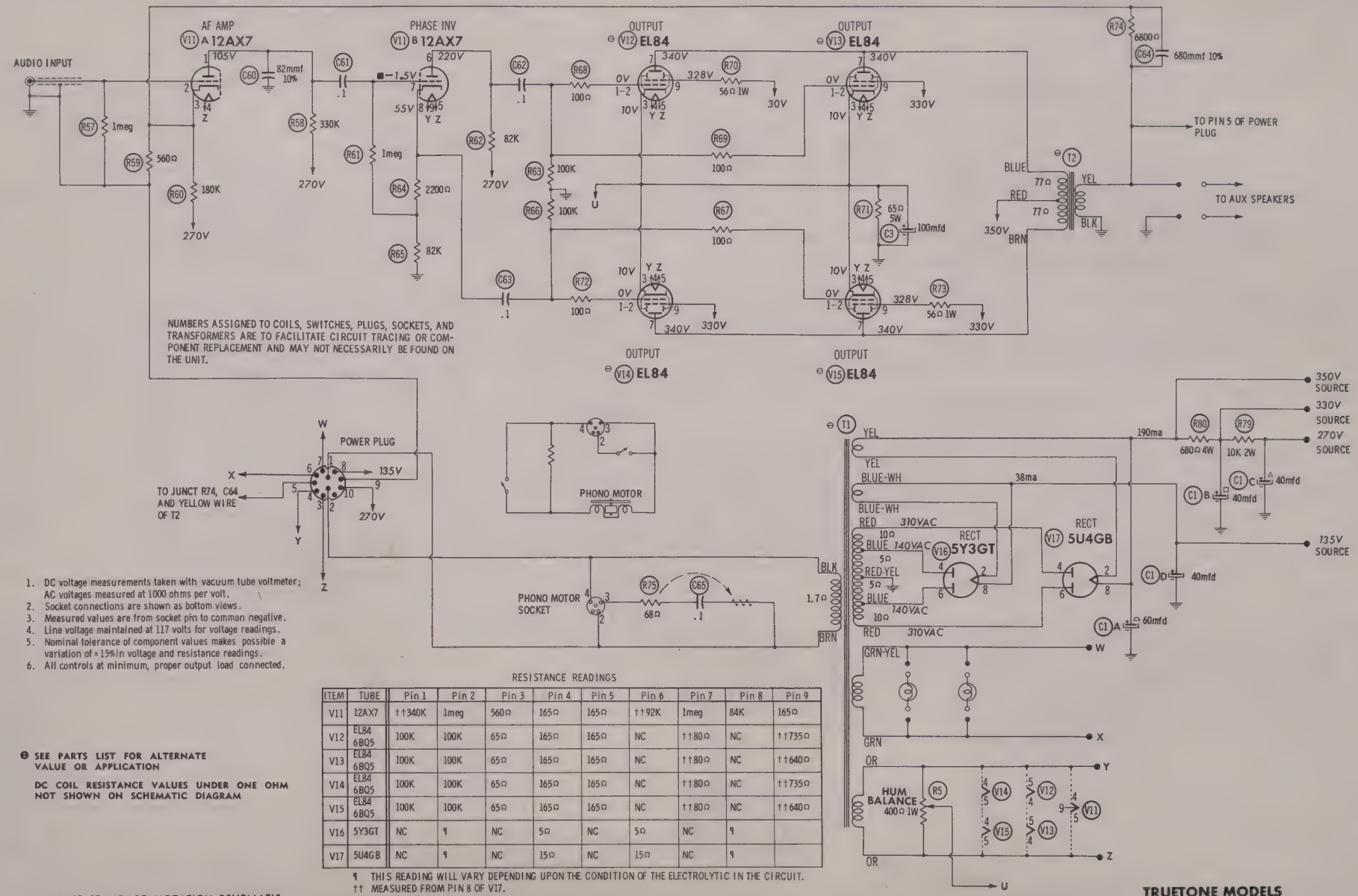
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	10A947-1	Tuning, Off-On Speaker Switch
Knob	10A948-1	Bass, Treble, Contour, Level, & Function
Dial Glass	58X808	
Dial Plate	25X2167-1	
Dial Pointer	15X286-1	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V11	12AX7	††340K	1meg	560Ω	165Ω	165Ω	††92K	1meg	84K	165Ω
V12	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††735Ω
V13	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††640Ω
V14	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††735Ω
V15	EL84 6BQ5	100K	100K	65Ω	165Ω	165Ω	NC	††80Ω	NC	††640Ω
V16	5Y3GT	NC	¶	NC	5Ω	NC	5Ω	NC	¶	
V17	5U4GB	NC	¶	NC	15Ω	NC	15Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V17.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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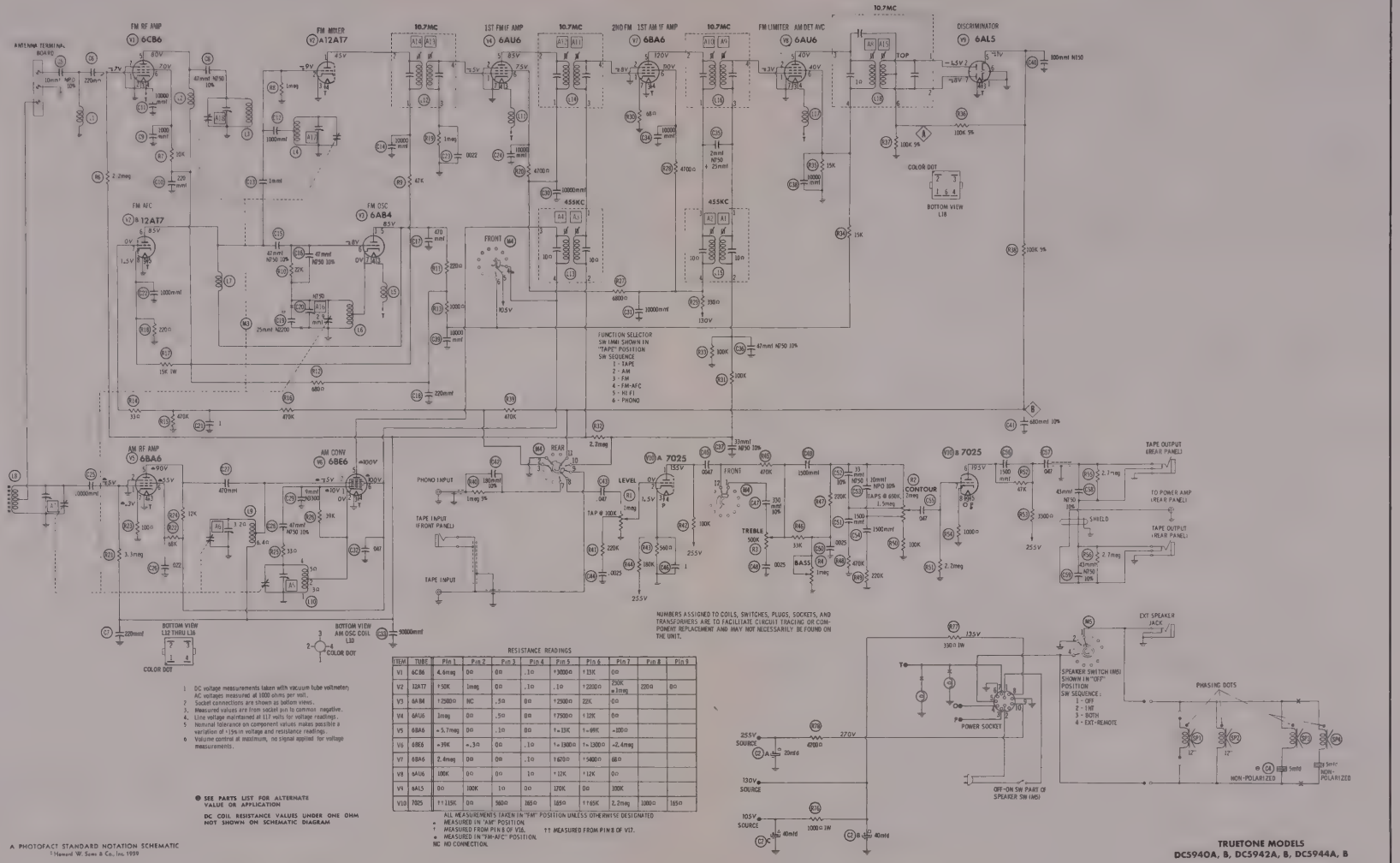
TRUETONE MODELS
DC5940A, B, DC5942A, B, DC5944A, B



RESISTANCE READINGS

TERM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	4.6meg	0Ω	0Ω	.1Ω	†300Ω	†13K	0Ω		
V2	12AT7	†50K	1meg	0Ω	.1Ω	.1Ω	†220Ω	250K =1meg	220Ω	0Ω
V3	6AB4	†250Ω	NC	.5Ω	0Ω	†250Ω	22K	0Ω		
V4	6AU6	1meg	0Ω	.5Ω	0Ω	†7500Ω	†12K	0Ω		
V5	6BA6	5.7meg	0Ω	.1Ω	0Ω	†=13K	†=69K	=100Ω		
V6	6BE6	=39K	=.3Ω	0Ω	.1Ω	†=1300Ω	†=1300Ω	=2.4meg		
V7	6BA6	2.4meg	0Ω	0Ω	.1Ω	†670Ω	†5400Ω	68Ω		
V8	6AU6	100K	0Ω	0Ω	1Ω	†12K	†12K	0Ω		
V9	6AL5	0Ω	100K	1Ω	0Ω	170K	0Ω	100K		
V10	7025	††115K	0Ω	560Ω	165Ω	165Ω	††65K	2.2meg	1000Ω	165Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
* MEASURED IN "AM" POSITION
† MEASURED FROM PIN 8 OF V6.
‡ MEASURED IN "FM-AFC" POSITION.
NC NO CONNECTION.
†† MEASURED FROM PIN 8 OF V17.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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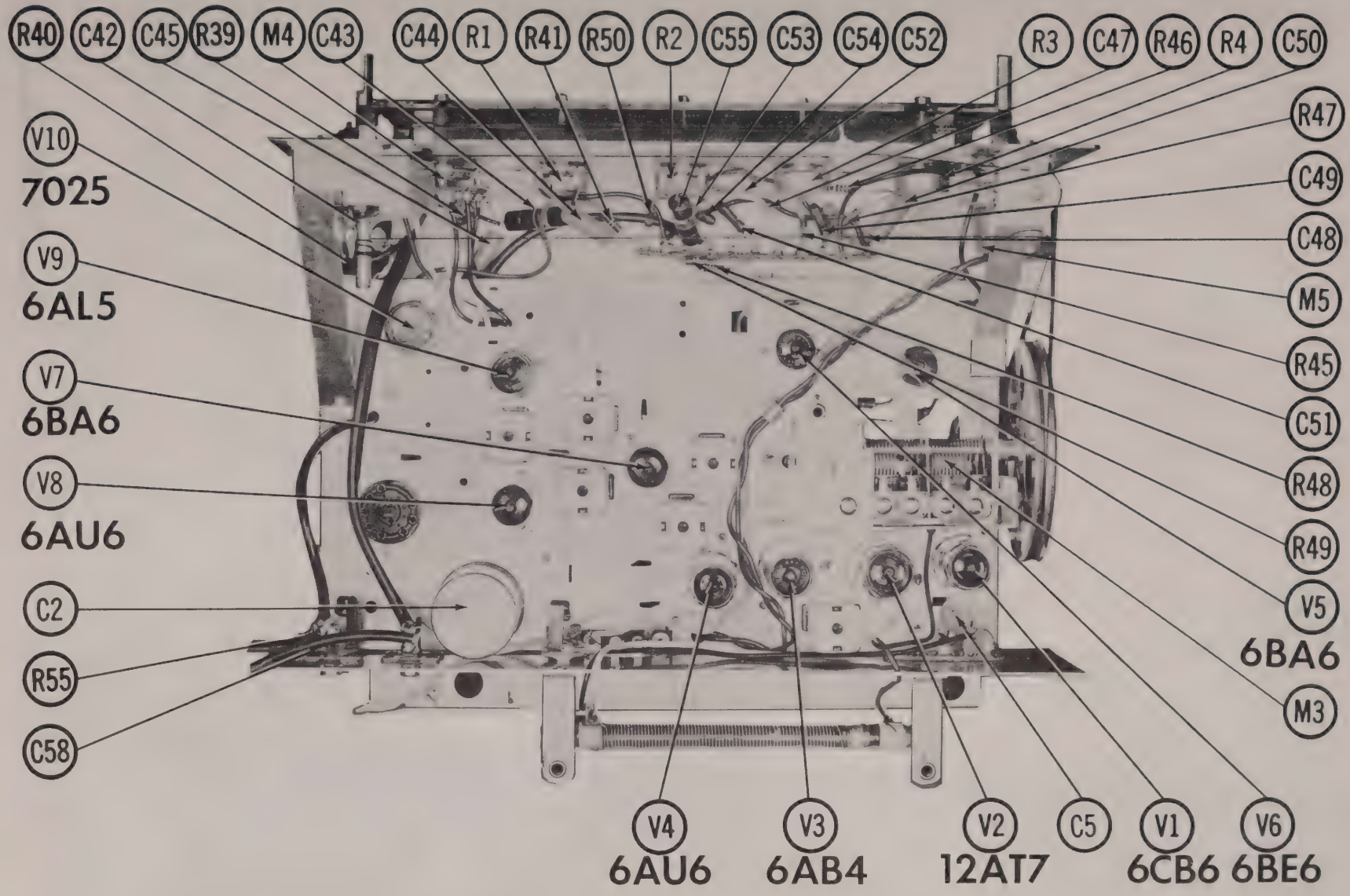
TRUETONE MODELS
DC5940A, B, DC5942A, B, DC5944A, B

TUNER SCHEMATIC



TUNER CHASSIS TOP VIEW - CAPACITOR, RESISTOR, MISC. & TUBE IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading.
Set Level, Bass and Treble at center of their ranges. Set Contour Control fully clockwise.
Suggested Alignment Tools: A1 thru A4, A8 thru A15 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5 thru A7, A16 thru A18 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 1 (grid) of AM RF Amp. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	"	A5	"
3.	"	"	1400KC	"	Tune to 1400KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.
4.		Loop	"	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.005mfd	High side to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe thru 100K to point (A). Common to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe thru 100K to point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.005mfd	High side to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. thru 100K to point (A). Low side to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	"	"	Vert. Amp. thru 100K to point (B). Low side to chassis.	A15	Adjust so that 10.7MC marker occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead.	108MC (400∿ FM Mod.)	FM	Tuning gang fully open	Across voice coil	A16	Adjust for maximum output.
8.	"	"	105MC	"	105MC	"	A17, A18	Adjust for maximum output while rocking tuning gang.

FIG. 1

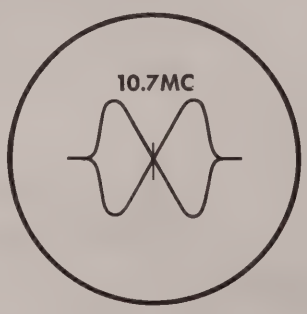
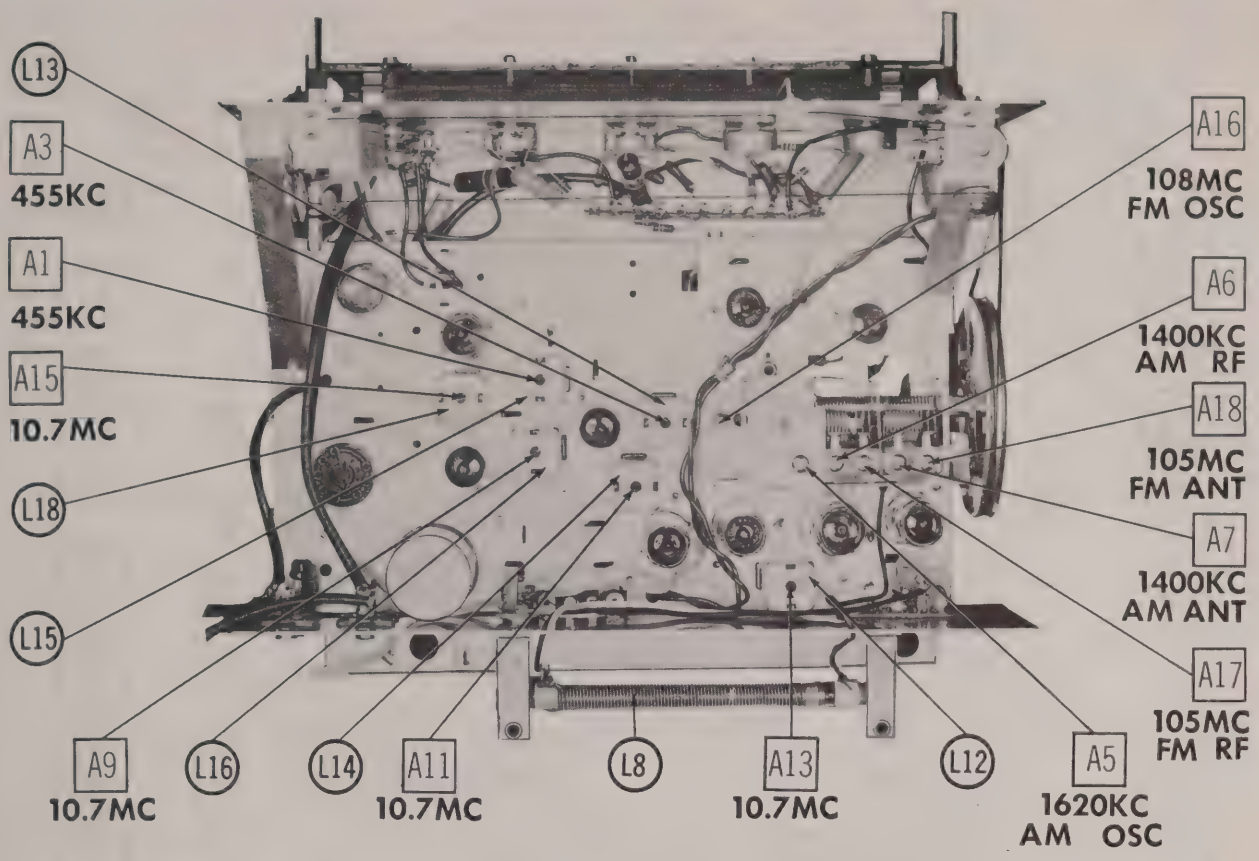
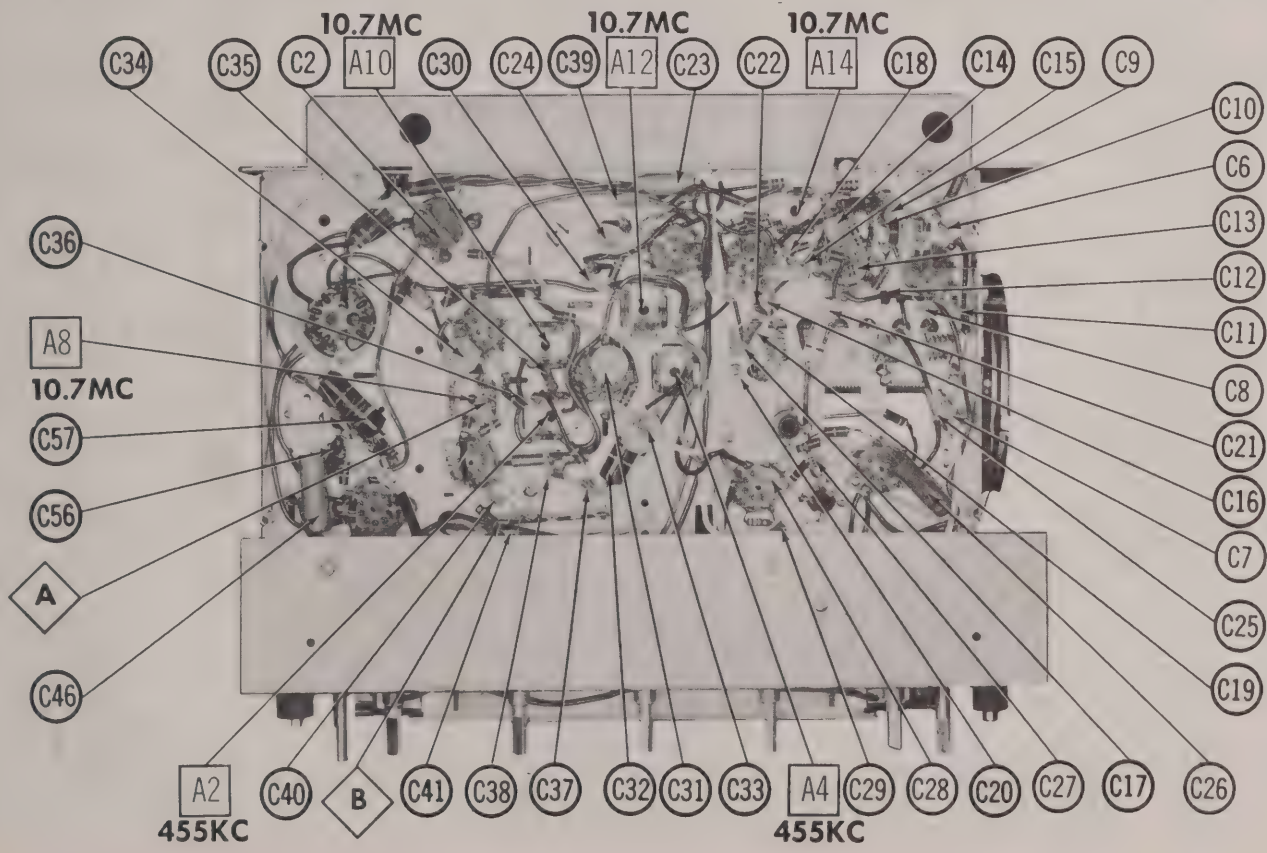


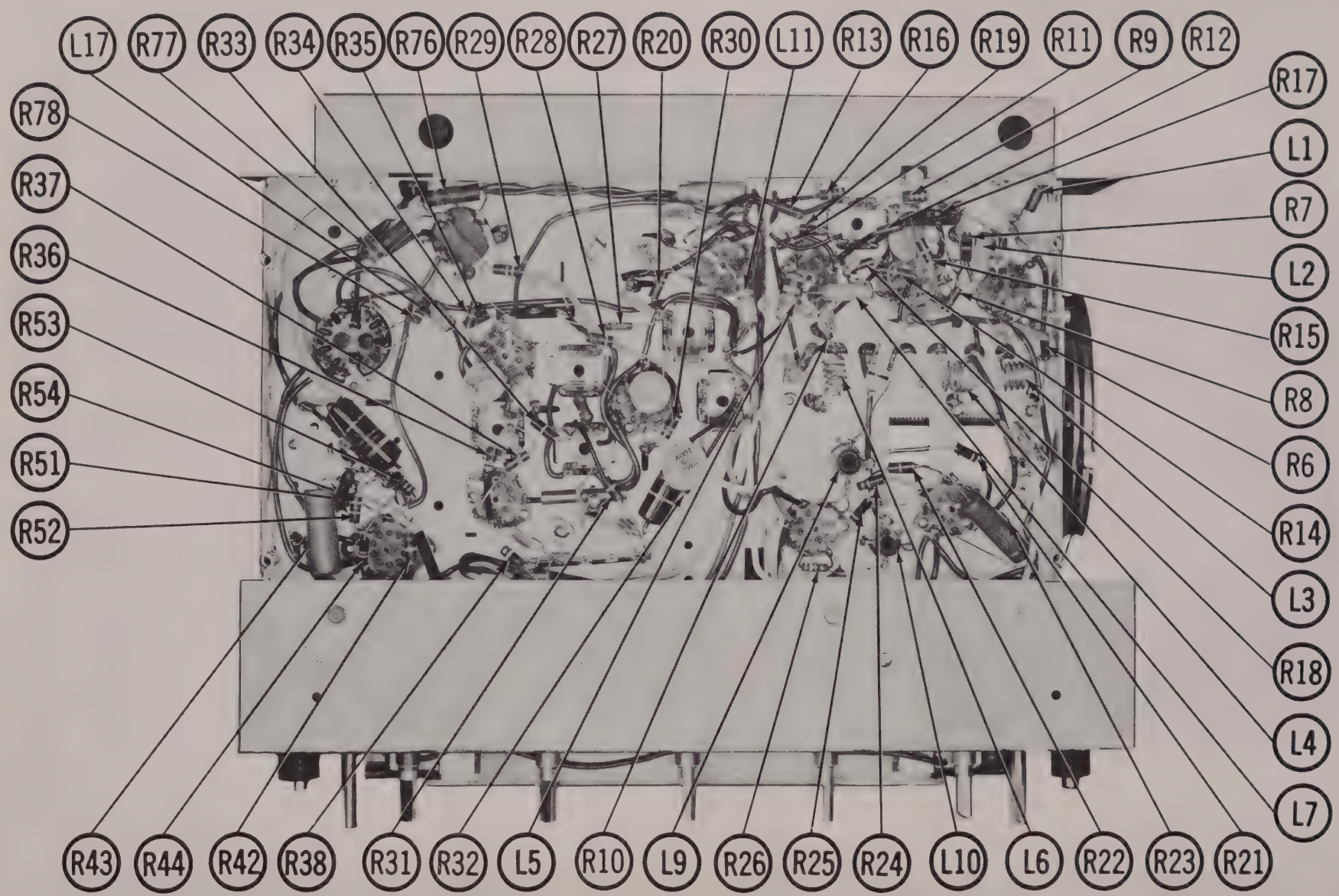
FIG. 2



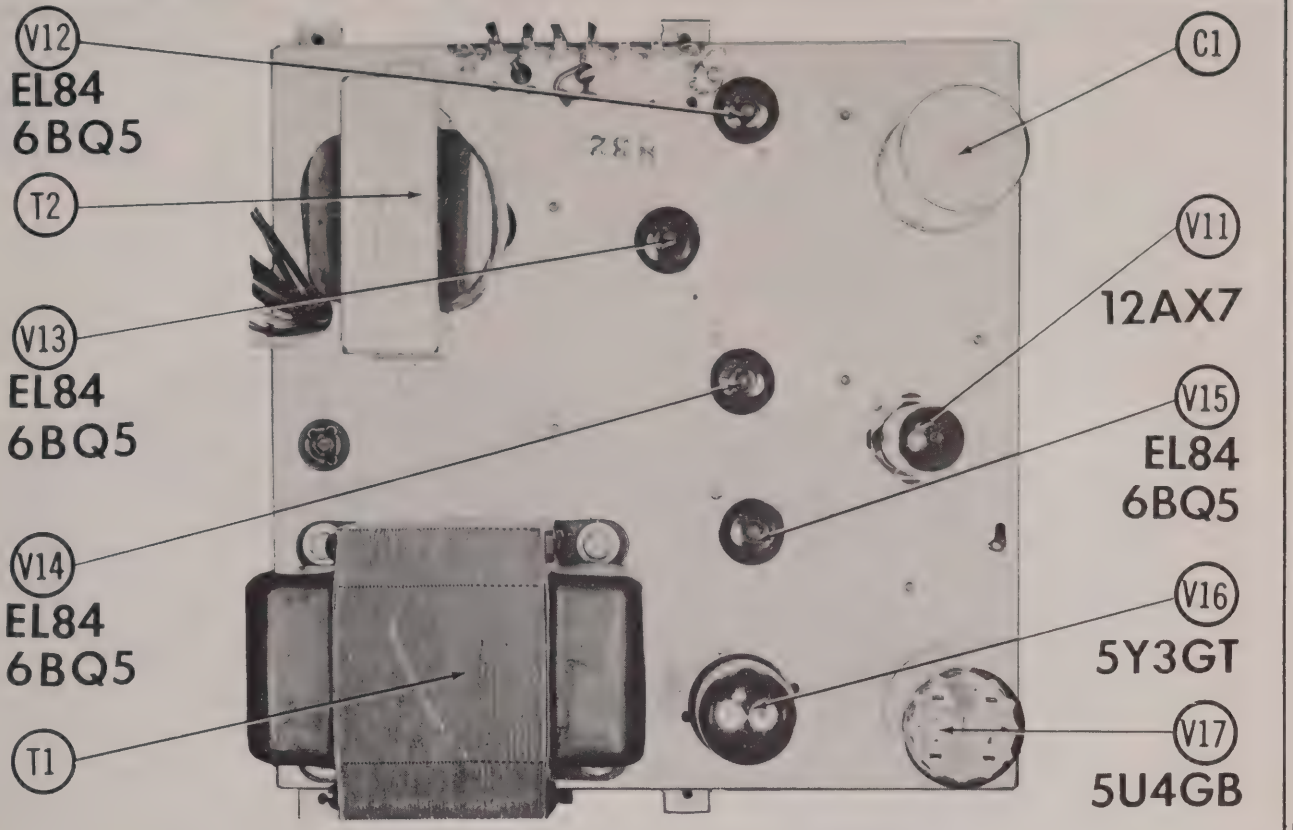
TUNER CHASSIS TOP VIEW - INDUCTOR & ALIGNMENT IDENT.



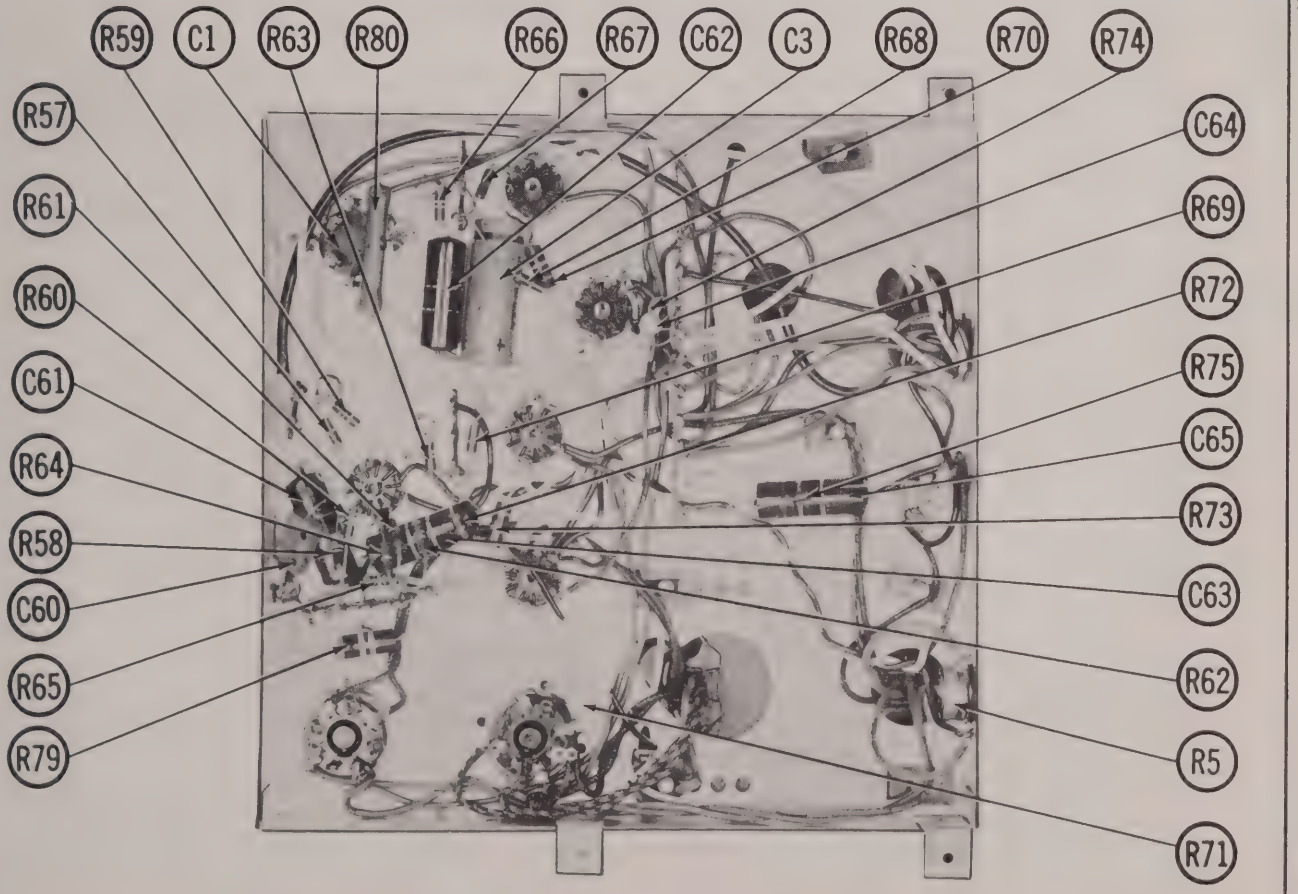
TUNER CHASSIS BOTTOM VIEW - CAPACITOR & ALIGNMENT IDENT.



TUNER CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



AMPLIFIER CHASSIS-TOP VIEW



AMPLIFIER CHASSIS - BOTTOM VIEW

PHOTOFACT* Folder

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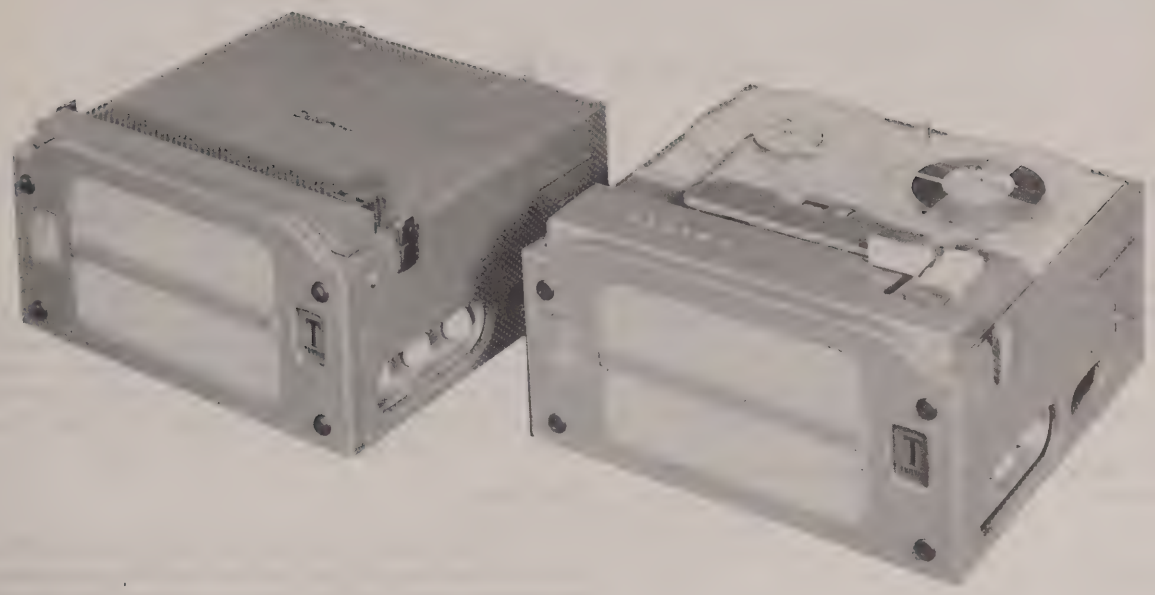
**TRUVOX
MODEL R2**

TRUVOX
MODEL R2



TRUVOX
MODEL R2

GENERAL INFORMATION

Truvox Model R2 Stereo Twin Set tape recorders will record and play back two tracks of material on standard-width recording tape. Thus, the recording and playback times are doubled, and stereo tape can also be recorded and played back.

A white light on the Model R2 glows when the unit is on. When the recorder is in the record position, the illuminated window on the front will show some green in the center.

Tape speeds are 3 3/4 and 7 1/2 ips. When both tracks are used, the recording times are as follows:

Reel Size	3 3/4 Ips	7 1/2 Ips
5" (600 ft.)	1 Hour	1/2 Hour
7" (1200 ft.)	2 Hours	1 Hour

Connect this recorder to a 110-120 volt, 60-cycle AC supply only.

Manufactured by:

Truvox Limited
Neasden Lane
London, N. W. 10, England

Supplied by:

Truvox (U. S. A.)
275 Seventh Avenue
New York 1, N. Y.

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

C404

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PREPARING FOR OPERATION

1. Remove the lids from the tape recorder and from the amplifier.
2. Plug the AC cord into the receptacle on the rear of the recorder. For stereo recordings, plug the cord into the amplifier also.
3. Before connecting to an AC source, be sure the On-Off switch on the Volume control of each unit is turned fully counterclockwise.
4. Connect the units to an AC source. Depress the Brake button to insure that the amplifiers are in the playback position, in order to prevent accidental erasure.

FUNCTIONS OF CONTROLS

Off

When the Off push button is depressed, the AC supply to the tape deck is switched off.

NOTE: The Brake push button must be depressed before the Off push button can be depressed. These buttons are interlocked.

Record-Playback

This control puts the tape in motion for recording or playback.

Fast Forward

The Fast Forward control enables the operator to advance the tape rapidly to any desired section.

Fast Reverse

The Fast Reverse control enables the operator to rewind the tape rapidly to any desired section.

Brake

Depressing the Brake button removes the AC voltage from the motor and simultaneously applies DC voltage. This DC voltage sets up a magnetic field, which stops the motor. The Brake button is spring-loaded and will apply the DC voltage to the motor as long as it is held down.

Tape Release

In the Forward position, the Tape Release lever holds the tape against the capstan and the play-record and erase heads. Pulling the lever toward the front of the cabinet releases the pressure exerted against the tape by the pressure roller and the pressure pads.

AMPLIFIER CONTROLS

Volume

This control turns the amplifier and tape deck on and off, and regulates the volume.

Turning the Volume control clockwise until a click is heard turns the power on. Rotating it further clockwise increases the volume

Change-over Switch

Turning this control clockwise places the amplifier in the record position. Depressing the Brake button releases it from the record position and automatically places it in playback.

Tone

Turning this control clockwise varies the tone of the recording.

OPERATING INSTRUCTIONS

Threading Tape

1. Place a reel of tape on the right spindle.
2. Depress Brake and Off buttons simultaneously.
3. Place an empty reel on the left spindle.
4. Unwind approximately two feet of tape from the right reel.
5. Insert tape into tape slot.
6. Insert free end of tape into one of three radial slots in left reel. Turn the reel three or four times to secure the tape and to take up any slack.

Recording from Microphone

1. Thread tape (see "Threading Tape").
2. Turn Volume control clockwise until it clicks.
3. Turn Change-over switch to Record position.
4. Insert microphone plug into jack 1.
5. Speak into microphone while adjusting the Volume control for the correct recording level.
6. Depress Record-Playback button.
7. Release the Tape Release lever.

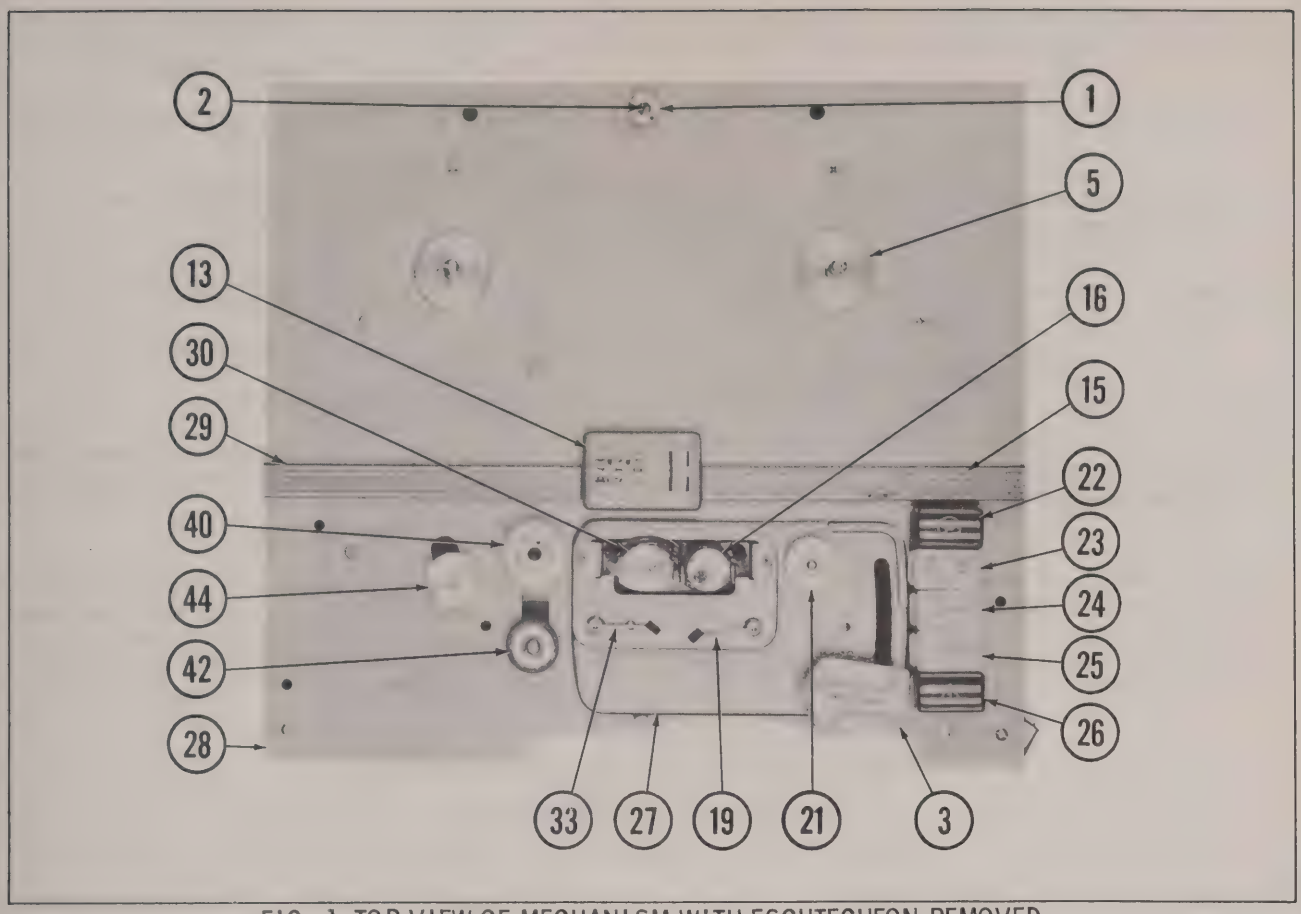


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTECHEON REMOVED

Recording from Radio

1. Thread tape (see "Threading Tape").
2. Turn Volume control clockwise until it clicks.
3. Turn Change-over switch to Record position.
4. Depress Record-Playback button.
5. Release the Tape Release lever.
6. Connect a lead from the AM radio output to jack 1 if the recording is to be made at low volume, to jack 2 if it is to be made at high volume.
7. When recording from FM tuners, connect the lead to jack 2 only.

To Record from Phonograph

1. Thread tape (see "Threading Tape").
2. Turn Volume control clockwise until it clicks.
3. Turn Change-over switch to Record position.
4. Depress Record-Playback button.
5. Release the Tape Release lever.
6. If the phonograph has a low output (such as a moving coil), connect to jack 1. If it has a high output (such as a crystal pickup), connect to jack 2.

External Speaker

Jack 4 is 15 ohms and can be used to feed external speakers of almost any impedance because this operation is not critical nor harmful.

Headphones

When headphones are used for dictation, keep the volume low to prevent noise and to avoid burning out the headphones.

Feeding Other Amplifiers or Recorders

Connect the amplifiers or recorders to jack 3. This is a high-impedance circuit and must not be shunted by low-impedance input circuits. The circuit is independent from the tape recorder Volume control. Therefore, the sound can be controlled from the other amplifier or recorder.

Stereophonic Recording

1. Connect the two units with the short coaxial cable.
2. Thread tape (see "Threading Tape").
3. Turn the two units on by rotating the Volume control on each unit.
4. Plug a microphone into jack 1 of unit A (the unit with the tape transport).

5. Plug a microphone into jack 1 of unit B (the unit with the amplifier and speaker only).

6. Turn the Change-over switch on both units to the Record position.

7. Place the microphones in front of the material to be recorded.

8. Depress the Record-Playback push button on unit A.

9. Release the Tape Release lever on unit A.

10. After the recording is completed, depress the Brake push button on each unit. While it is depressed, also depress the Off push button on unit A.

11. Pull the Tape Release lever back until it locks in its catch on unit A.

NOTE: Unit A is the left channel, and unit B is the right channel.

To Play Back Stereophonic Recordings

1. Thread tape (see "Threading Tape").

2. Connect unit B to unit A with the long coaxial cable.

3. Turn the power on by rotating the Volume control on units A and B.

4. Depress the Brake push button to make sure the units are in the playback position.

5. Depress the Record-Playback push Button.

6. Release the Tape Release lever.

7. Adjust the two Volume controls until the volumes are equal and are at the desired listening level.

Erasing Recorded Material

Any recording is erased automatically before a new one is put on the tape. To erase a recording without putting a new one on the tape, follow the normal recording procedure, but turn the Volume control to its minimum setting.

DISASSEMBLY INSTRUCTIONS

To Remove the Units from Their Cases

1. Remove the two screws that protrude through the handle.

2. Remove the two Phillips screws, one on each side, at the front of the case.

3. Slide the units from the case.

To Remove the Amplifier from the Tape Transport

1. Disconnect the speaker leads.

2. Remove the coil mounted on the speaker mounting stud.

3. Remove the four feet holding the front panel, and lift off the panel and speaker.

4. Disconnect the play-record head leads from the Change-over switch.

5. Disconnect the erase head leads from the terminal and ground.

6. Disconnect the leads for the Dynamic Brakes.

7. Remove the two screws holding the amplifier to the brackets, at the rear of the tape transport.

8. Lift the amplifier away from the tape transport.

9. To reassemble, reverse the foregoing procedure.

To Remove the Amplifier from the Case Top

1. Disconnect the speaker leads.

2. Remove the coil mounted on the speaker mounting stud.

3. Remove the four feet holding the front panel, and lift off the panel and speaker.

4. Remove the two screws holding the amplifier to the brackets, at the rear of the case.

5. Lift the amplifier away from the case top.

6. To reassemble, reverse the foregoing procedure.

PLAY-RECORD HEAD ADJUSTMENTS

1. Remove head cover (11).

2. Thread a prerecorded tape of good quality onto the recorder.

3. Turn the unit on.

4. Depress the Record-Playback push button.

5. Release the Tape Release lever.

6. Adjust head mounting screw (37) until a maximum high-note response is obtained.

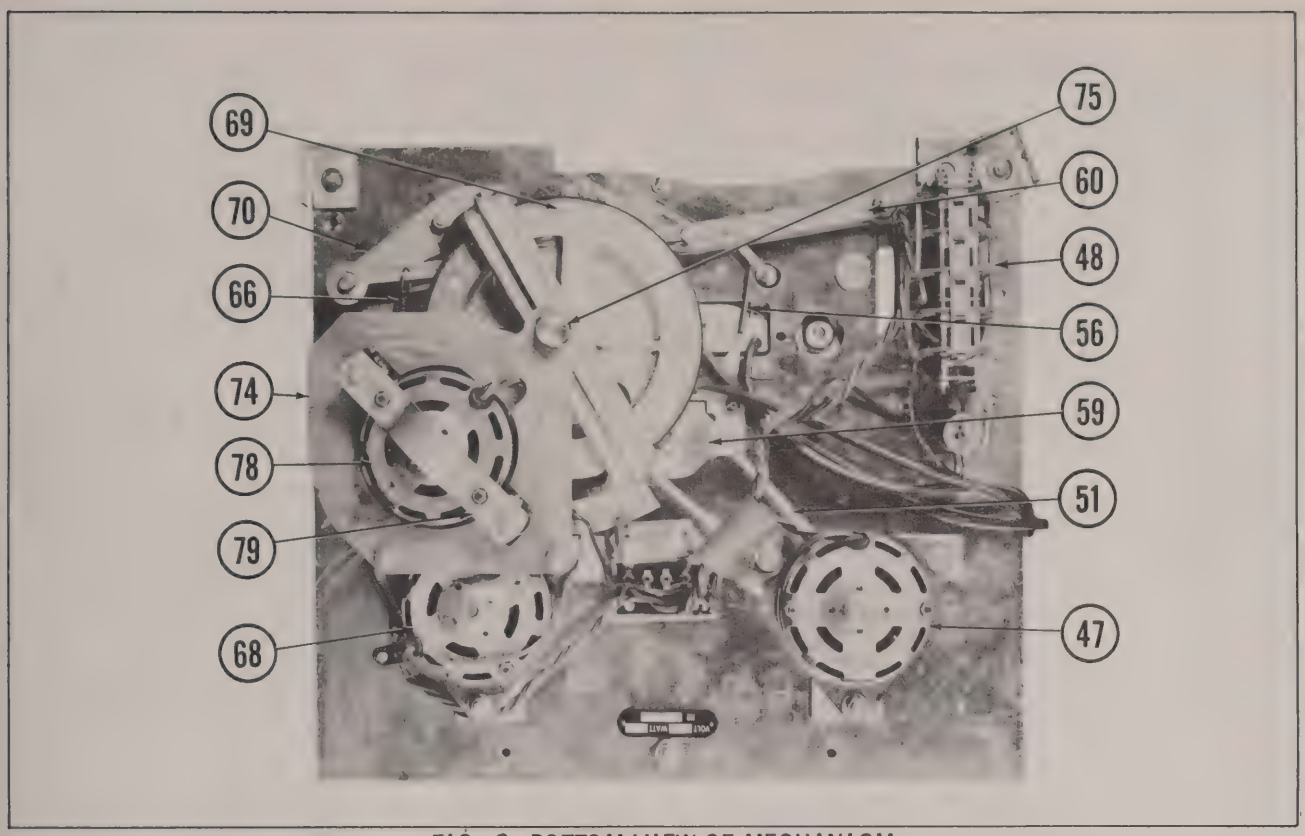


FIG. 2 BOTTOM VIEW OF MECHANISM

LUBRICATION

The tape transport has been lubricated at the factory, and no further lubrication should be required. However, the tape transport should always be lubricated whenever any parts are replaced.

CLEANING

The record and erase heads, capstan shaft, and pressure roller (42) may accumulate tape coating residue, which is worn off the tape as it passes these parts. This residue can cause distortion, weak output, and poor erasure. Clean the head surfaces, capstan shaft, and pressure roller with a damp cloth.

TROUBLE CHART

Symptom	Cause	Remedy
Counter (13) does not function.	1. Counter drive belt (51) has slipped off the drive pulley, or is broken.	1. Replace counter drive belt (51).
Insufficient pressure of pressure pads (19) and (33) against the tape when the Tape Release lever is released.	1. Tension springs (56) disconnected or broken.	1. Reconnect or replace tension springs (56).
Insufficient pressure of pressure roller (42) against the capstan.	1. Tension spring(66) broken or disconnected.	1. Replace or reconnect tension spring (66).
Weak recording and playback.	1. Record-playback head(30) dirty.	1. See "Cleaning."
Flywheel slips on motor drive shaft.	1. Oil on motor shaft and on rubber tire of flywheel.	1. See "Cleaning."

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1		3 3/4 ips Capstan
2		Capstan Storage Post
3		Tape Release Knob
4		Rubber Washer
5		"Hubloc" Reel Holder
6		Clamp
7		Screw
8		Washer
9		Hex Nut
10		Rubber Washer
11		Head Cover
12		Escutcheon
13		Counter
14		Erase Head Mounting Screw
15		Trim Strip (Right)
16		Erase Head
17		Head Cover Fastener
18		Head Mounting Bracket
19		Right Pressure Pad Ass'y.
20		"C" Washer
21		Tape Guide Roller
22		Off Button
23		Record/ Playback Button
24		Fast Forward Button
25		Fast Reverse Button
26		Brake Button
27		Dress Plate
28		Base Plate
29		Trim Strip (Left)
30		Record/Playback Head
31		Head Cover Fastener
32		Record/ Playback Head Mtg. Bracket
33		Left Pressure Pad Ass'y.
34		Tape Guide Mtg. Screw
35		Tension Spring
36		Cotter Key
37		Head Mtg. Screw
38		Tape Guide Hold Down Plate
39		Tape Guide Post
40		7 1/2 ips Capstan
41		"C" Washer

Ref. No.	Part No.	Description
42		Pressure Roller
43		Tape Guide Mtg. Screw
44		Tape Guide
45		Right Mtg. Bracket
46		Motor Mtg. Stud
47		Fast Reverse Motor
48		Function Switch
49		Spacer
50		Spacer
51		Counter Drive Belt
52		Counter Drive Pulley
53		Spacer
54		Motor Mtg. Stud
55		Right Pressure Pad Lever
56		Tension Spring
57		Tension Spring Fastener
58		Counter Mtg. Plate
59		Counter Pulley
60		Tape Release Lever
61		Tape Release Lever Catch
62		Pinch Roller Mtg. Stud
63		Tape Release Lever Locking Pin
64		Wire Clamp
65		"C" Washer
66		Tension Spring
67		Mounting Stud
68		Fast Forward Motor
69		Flywheel
70		Flywheel Housing
71		Drive Motor Mtg. Stud
72		Fan
73		Ball Bearing
74		Motor Shield
75		Flywheel Adjusting Screw
76		Shock Mount Clamp
77		Shock Mount
78		Motor Mtg. Stud
79		Motor Mtg. Bracket
80		Left Pressure Pad Lever
81		Left Mtg. Bracket

RECORDER AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	Preamplifier	EF86 * (6267) †
V2	AF Amplifier	ECC83 (12AX7) †
V3	Output	EL84 (6BQ5) †
V4	Record Level	EM81
V5	Bias Oscillator	6BW6
V6	Rectifier	&Z81 (6BW4) †

*Alternate Z729

† Domestic Equivalent

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	350		AFH2-39	C0225	FP227.3	TDLD-30	TVL-2628	
B	20	350							
C2A	40	350		AFH2-39	C0225	FP227.3	TDLD-30	TVL-2628	
B	20	350							
C3	50	12		SRE12V50	BBR50-25	TC29	ML50-15	TE-1133	
C4	50	12		SRE12V50	BBR50-25	TC29	ML50-15	TE-1133	
C5	50	25		SRE25V50	BBR50-25	TC29	TD-50-25	TE-1209	
C6	1	350		PRS1700	BR145	TC595	TD-2-450	TVA-1701	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.1 250V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P1
C8	.5 250V		P488N-5		CUB4P5		GEM-405	4TM-P5
C9	.00015 250V 5%			TCZ-150	C10T15C	CM-20B-151J	CNO-315	MS-315
C10	.00068 350V 5%				1R5T68	CM-20B-681J		MS-368
C11	.005 350V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C12	.1 250V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P1
C13	.05 250V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C14	.003 400V		P488N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D3
C15	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C16	.1 250V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P1
C17	.0002 250V 5%			TCZ-200	22R5T2	CM-20B-201J	MCE237	MS-32
C18	.02 150V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C19	.0003 500V 5%			TCZ-300	22R5T3	CM-20B-301J	MCE241	MS-33
C20	10000		1467-01M	D6-103	1D5S1	CCD-103	MC475	
C21	.001 350V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GTM-621	6TM-D1
C22	.001 350V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GTM-621	6TM-D1
C23	.1 500V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C24	.1 500V		P688N-1	DF-104	CUB6P1	6DP-1-102	GEM-601	6TM-P1

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½		B-60-S	A47-500K-Z	Q13-133	U48	Volume, Channel A
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-20	76-2	US-27	Power Off-On, Channel A
R2A	50K	½						Tone, Channel A
B	Switch							Monitor, Channel A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	
R4	220K	
R5	1meg	
R6	2200Ω 1W	
R7	220K	
R8	220K	
R9	4700Ω	
R10	220K	
R11	10K	
R12	470K	
R13	220K	
R14	2200Ω 1W	
R15	1meg	

ITEM No.	RATING	REMARKS
R16	47K	
R17	220K	
R18	1meg	
R19	2200Ω 1W	
R20	470K	
R21	470K	
R22	1meg	
R23	2.2meg	
R24	1meg	
R25	47K	
R26	1000Ω 1W	
R27	220Ω 1W	
R28	10K	

ITEM No.	RATING	REMARKS
R29	470K	
R30	10K	
R31	180Ω 1W	
R32	10Ω 2W	
R33	1meg 1W	
R34	470Ω 5% 5W	#AX3511
R35	47K	
R36	47K	
R37	500Ω 25W	
R38	700Ω 25W	
R39	10Ω 10W	

COILS

ITEM No.	USE	REPLACEMENT DATA TRUVOX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke							3uh
L2	Tone Choke							455MH
L3	Bias Osc.							

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA TRUVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	240V Taps ② 210V, 150V 127V, 117V ② .55A	600VCT ② .070A	6.3V ② .9A	MB172						
	SEC. 3. 6.3V ② 2.4A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	9000Ω	6Ω Tap 3Ω		24S64 ①	A-2902①	AU-604①	A-3849①	24S64 ①	S-53X ①	① Drill new mounting hole

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TRUVOX PART No.	QUAM PART No.	NOTES
SP1	6" x 10"	PM	3-4Ω		69A3	

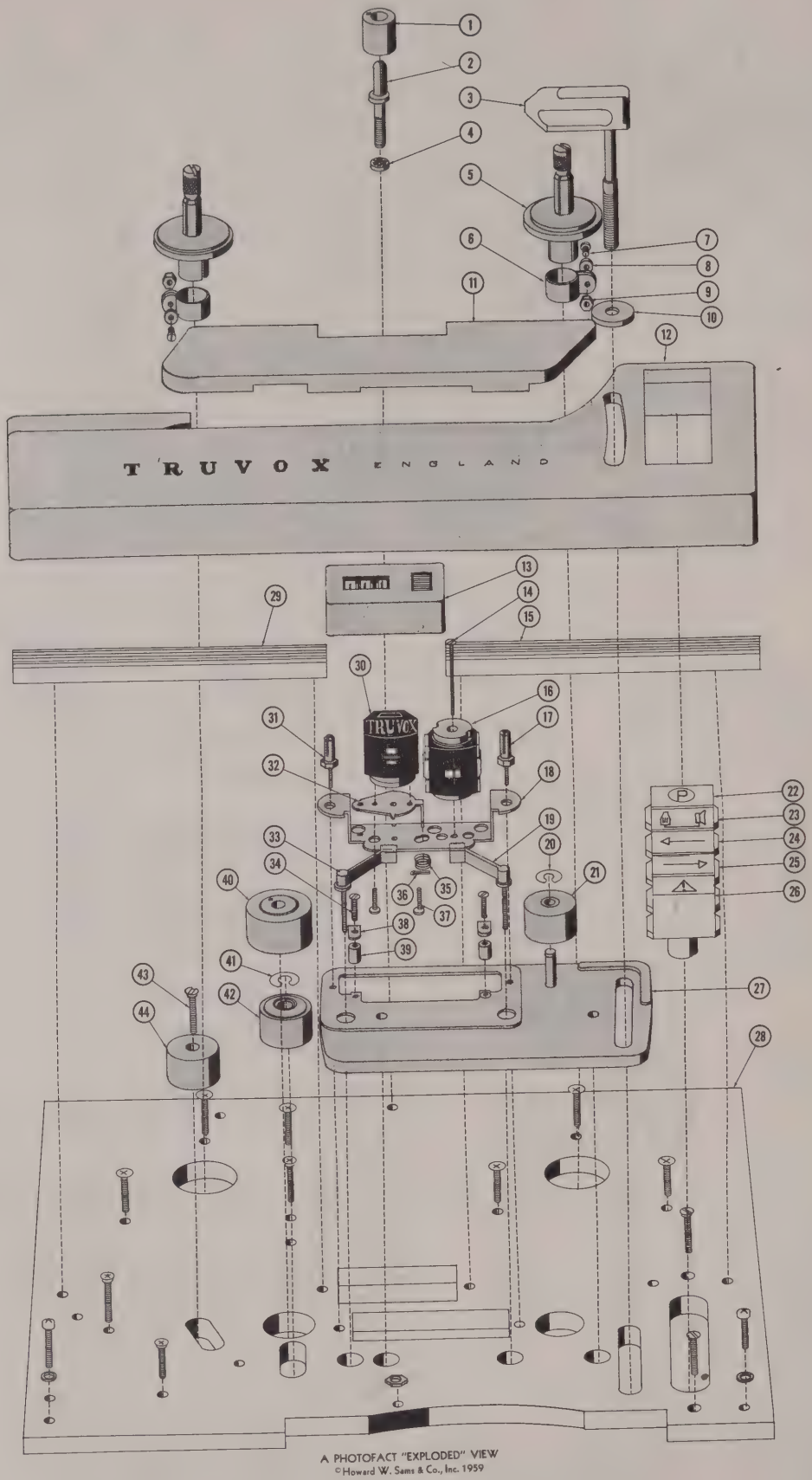


FIG. 3A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

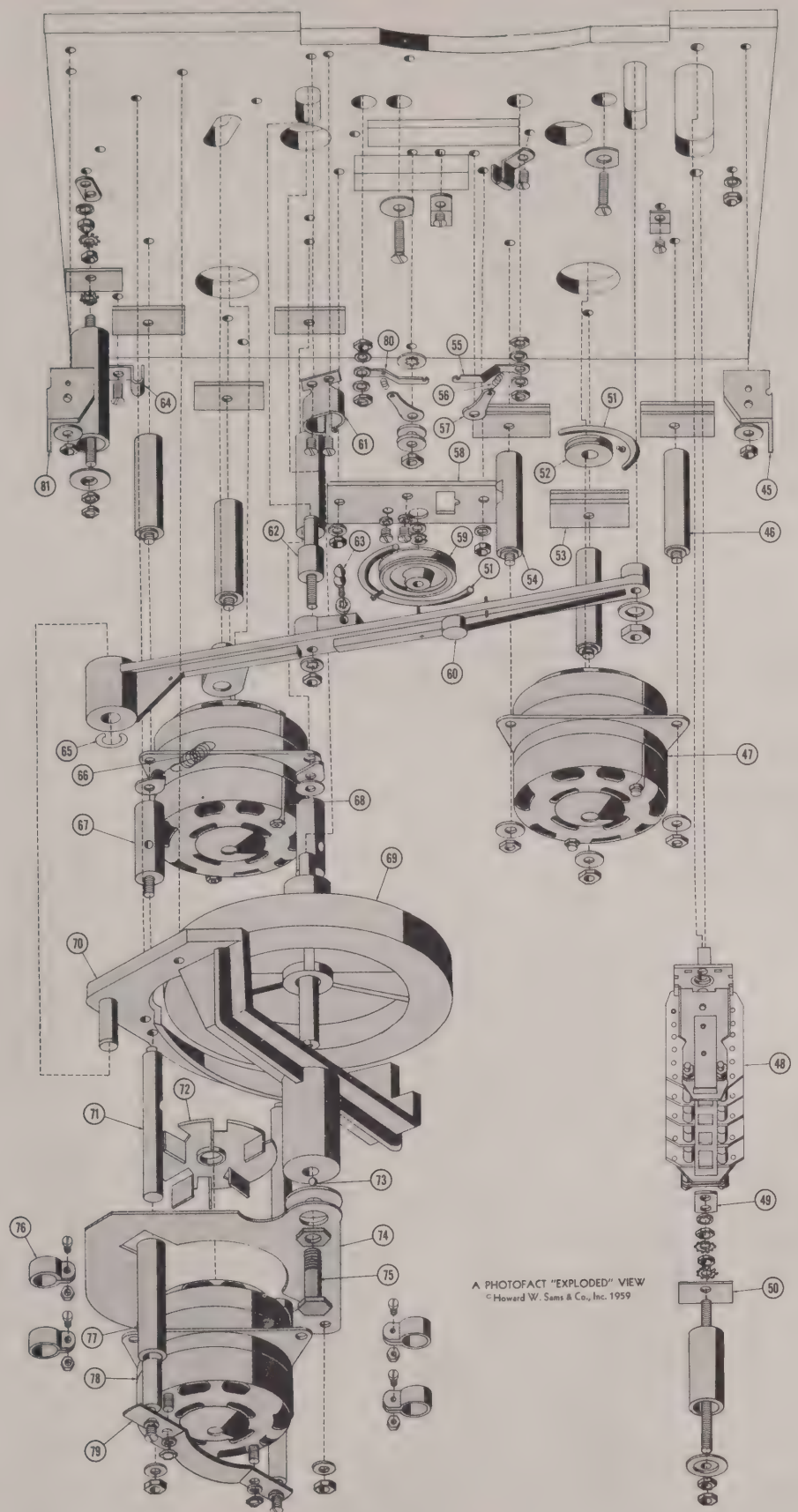


FIG. 3B EXPLODED VIEW OF PARTS BELOW BASEPLATE

RECORDER AMP PARTS LIST(Cont)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUVOX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1. 5A 250V			3120L 5 3AG 1½A 250V)	356001	AGC1½	4405
M2	3AG	1. 5A 250V			3120L 5 3AG 1½A 250V)	356001	AGC1½	4405

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TRUVOX PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	5A81					Record Level Rect. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRUVOX PART No.	NOTES
M4	Erase Head		
M5	Record & Playback Head		
M6	Switch		Function
M7	Switch		On Tape Transport Brake, Fast Rewind, Fast Forward. Rec. Play, Off (Pushbutton Assembly)
M8	Motor		Forward
M9	Motor		Rewind
M10	Motor		Drive

CABINETS & CABINET PARTS

When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

AUX AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		RAYTHEON ◆		SYLVANIA ◆	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V7	Preamplifier	EF86 *	(6267) †	V10	Record Level	EM81	
V8	AF Amplifier	ECC83	(12AX7) †	V11	Bias Oscillator	6BW6	
V9	Output	EL84	(6BQ5) †	V12	Rectifier	EZ81	(6BW4) †

* Alternate Z729 † Domestic Equivalent

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TRUVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C25A	40	350		AFH2-39	C0225	FP227.3	TDLD-30	TVL-2628	
B	20	350							
C26A	40	350		AFH2-39	C0225	FP227.3	TDLD-30	TVL-2628	
B	20	350							
C27	50	12		SRE12V50	BBR50-25	TC29	ML50-15	TE-1133	
C28	50	12		SRE12V50	BBR50-25	TC29	ML50-15	TE-1133	
C29	50	25		SRE25V50	BBR50-25	TC29	TD-50-25	TE-1209	
C30	1	350		PRS1700	BR145	TC595	TD-2-450	TVA-1701	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C31	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C32	.5 250V		P488N-5		CUB4P5		GEM-405	4TM-P5
C33	.00015 250V 5%			TCZ-150	C10T15C	CM-20B-151J	CNO-315	MS-315
C34	.00068 250V 5%				1R5T68	CM-20B-681J		MS-368
C35	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C36	.1 250V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P1
C37	.05 250V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C38	.003 400V		P488N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D3
C39	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C40	.1 250V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P1
C41	.0002 250V 5%			TCZ-200	22R5T2	CM-20B-201J	MCE237	MS-32
C42	.02 150V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C43	.0003 500V 10%			TCZ-300	22R5T3	CM-20B-301K	MCE241	MS-33
C44	10000		1467-01M	D6-103	1D5S1	CCD-103	MC475	
C45	.001 350V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GTM-621	6TM-D1
C46	.001 350V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GTM-621	6TM-D1
C47	.001 350V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GTM-621	6TM-D1

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R40A	500K	½		B-60-S	A47-500K-Z	Q13-133	U48	Volume, Channel B
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-20	76-2	US-27	Power Off-On, Channel B
R41A	50K	½						Tone, Channel B
B	Switch							Monitor, Channel B

AUX AMP PARTS LIST (Cont)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R42	1meg	
R43	220K	
R44	1meg	
R45	2200Ω 1W	
R46	220K	
R47	220K	
R48	4700Ω	
R49	220K	
R50	10K	
R51	470K	
R52	220K	
R53	2200Ω 1W	

ITEM No.	RATING	REMARKS
R54	1meg	
R55	47K	
R56	220K	
R57	1meg	
R58	2200Ω 1W	
R59	470K	
R60	470K	
R61	1meg	
R62	2.2meg	
R63	1meg	
R64	47K	
R65	1000Ω 1W	

ITEM No.	RATING	REMARKS
R66	220Ω 1W	
R67	10K	
R68	470K	
R69	10K	
R70	180Ω 1W	
R71	10Ω 2W	
R72	1meg 1W	
R73	470Ω 5% 5W	#AX3511
R74	47K	
R75	47K	
R76	10Ω 10W	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUVOX PART No.	QUAM PART No.	
SP2	6" x 10"	PM	3-4Ω		69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUVOX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M11	3AG	1.5A 250V			3120L 5 (3AG 1½A 250V)	356001	AGC1½	4405
M12	3AG	1.5A 250V			3120L 5 (3AG 1½A 250V)	356001	AGC1½	4405

COILS

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRUVOX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L4	RF Choke							3uh 455MH
L5	Tone Choke							
L6	Bias Osc.							
L7	Left Channel Bias Loading Coil							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TRUVOX PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M13	5A81					Record Level Tube, Rect. (Pigtail)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	TRUVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	240V Taps ② 210V, 150V 127V, 117V ② .55A SEC. 3 6.3V ② 2.4A	600VCT ② .070A	6.3V ② .9A	MB172						

MISCELLANEOUS

ITEM No.	PART NAME	TRUVOX PART No.	NOTES
M14	Record & Playback Head		
M15	Switch		Function

CABINETS & CABINET PARTS

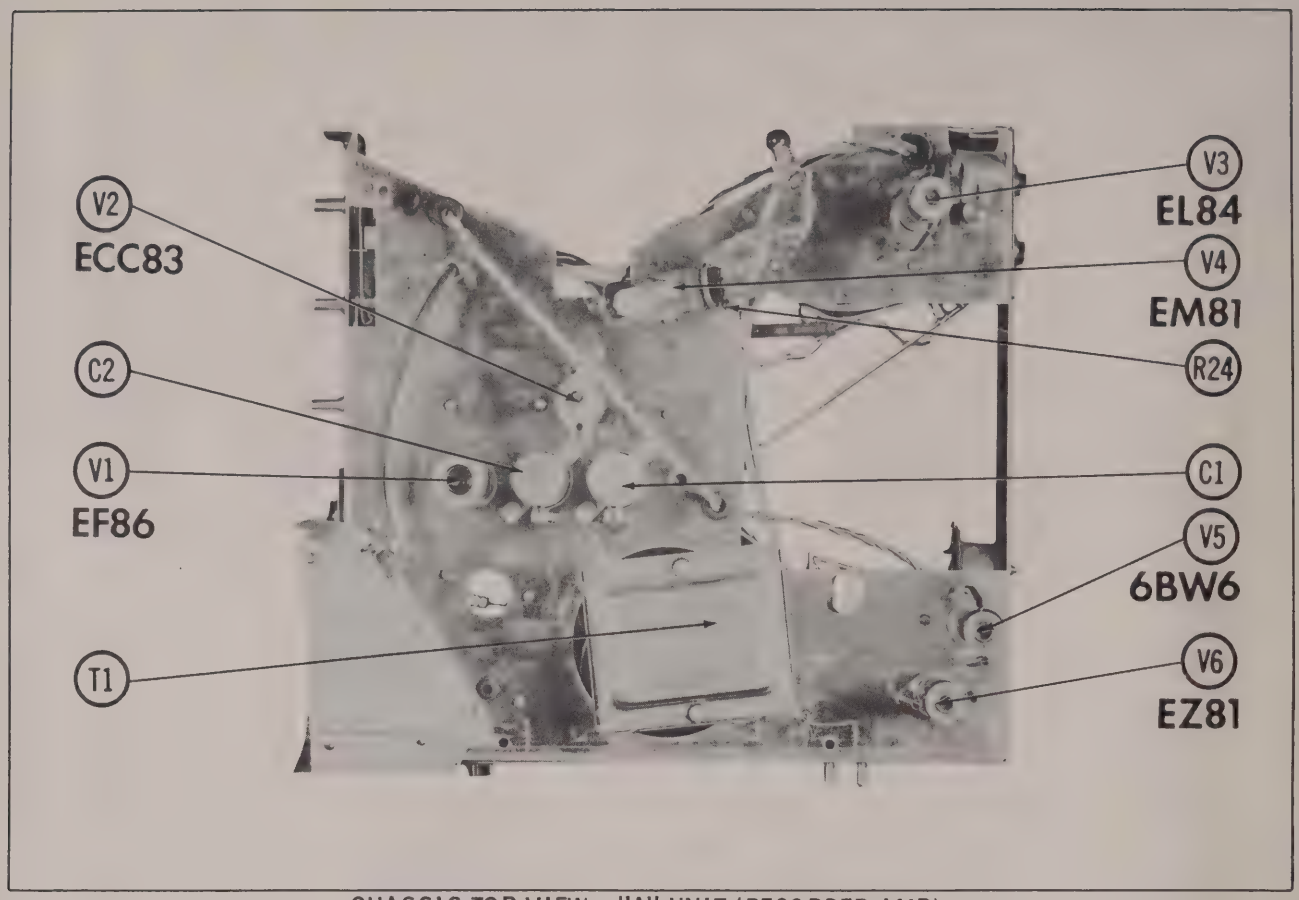
When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

TRANSFORMER (AUDIO OUTPUT)

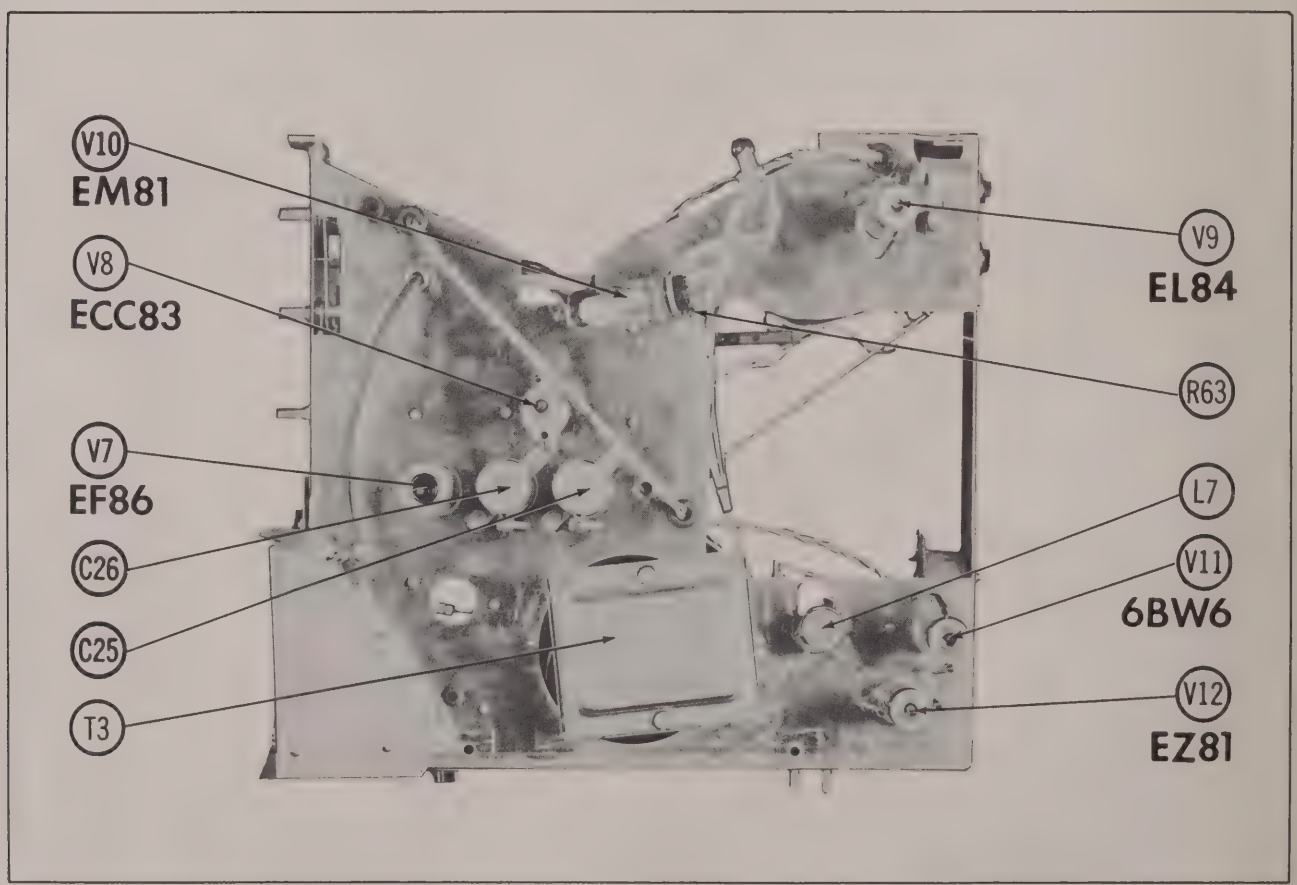
ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	9000Ω	6Ω Tap ② 3Ω		24S64 ①	A-2902①	AU-604①	A-3849①	24S64 ①	S-53X ①	① Drill new mounting hole

WIRING DATA

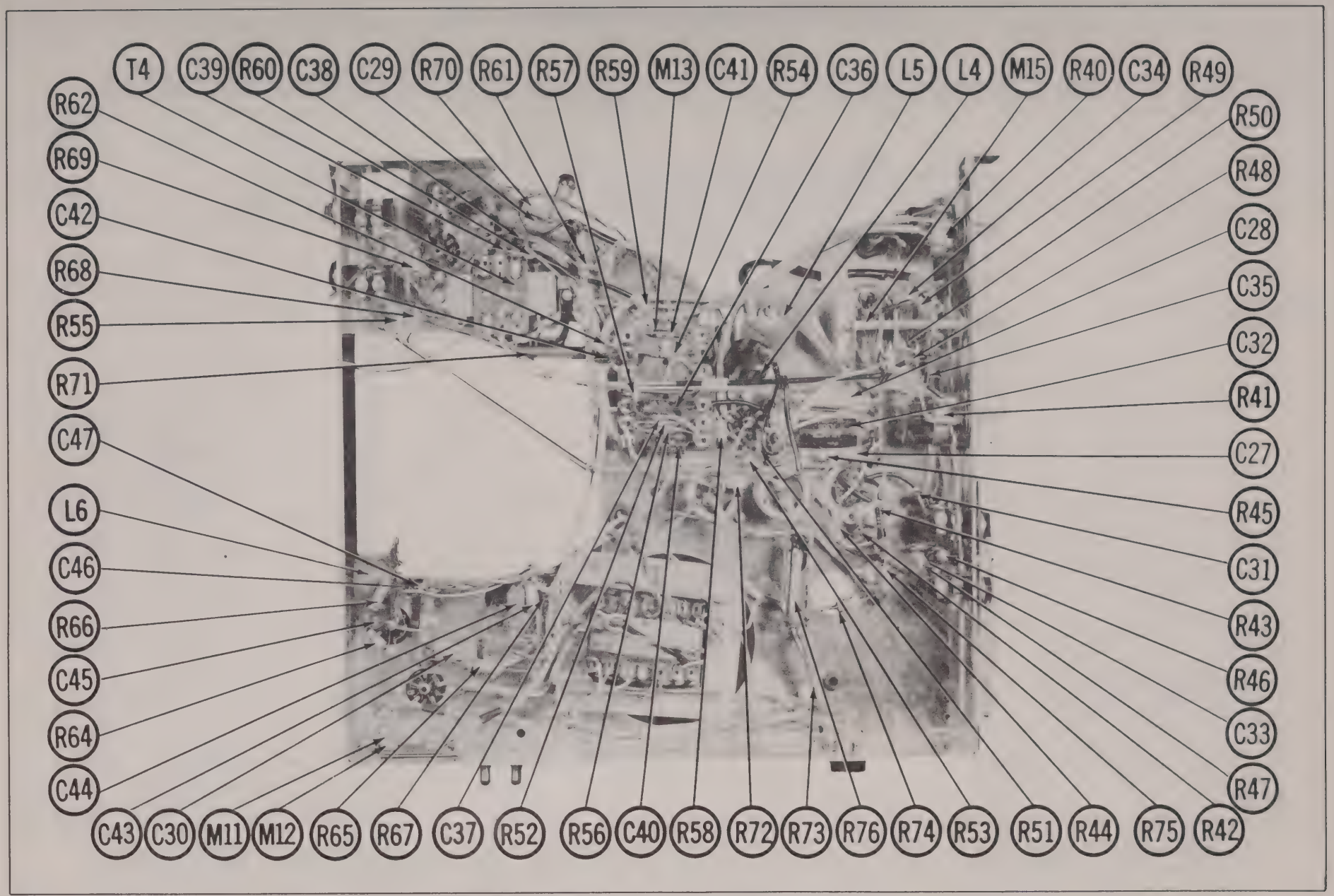
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



CHASSIS TOP VIEW - "A" UNIT (RECORDER AMP)



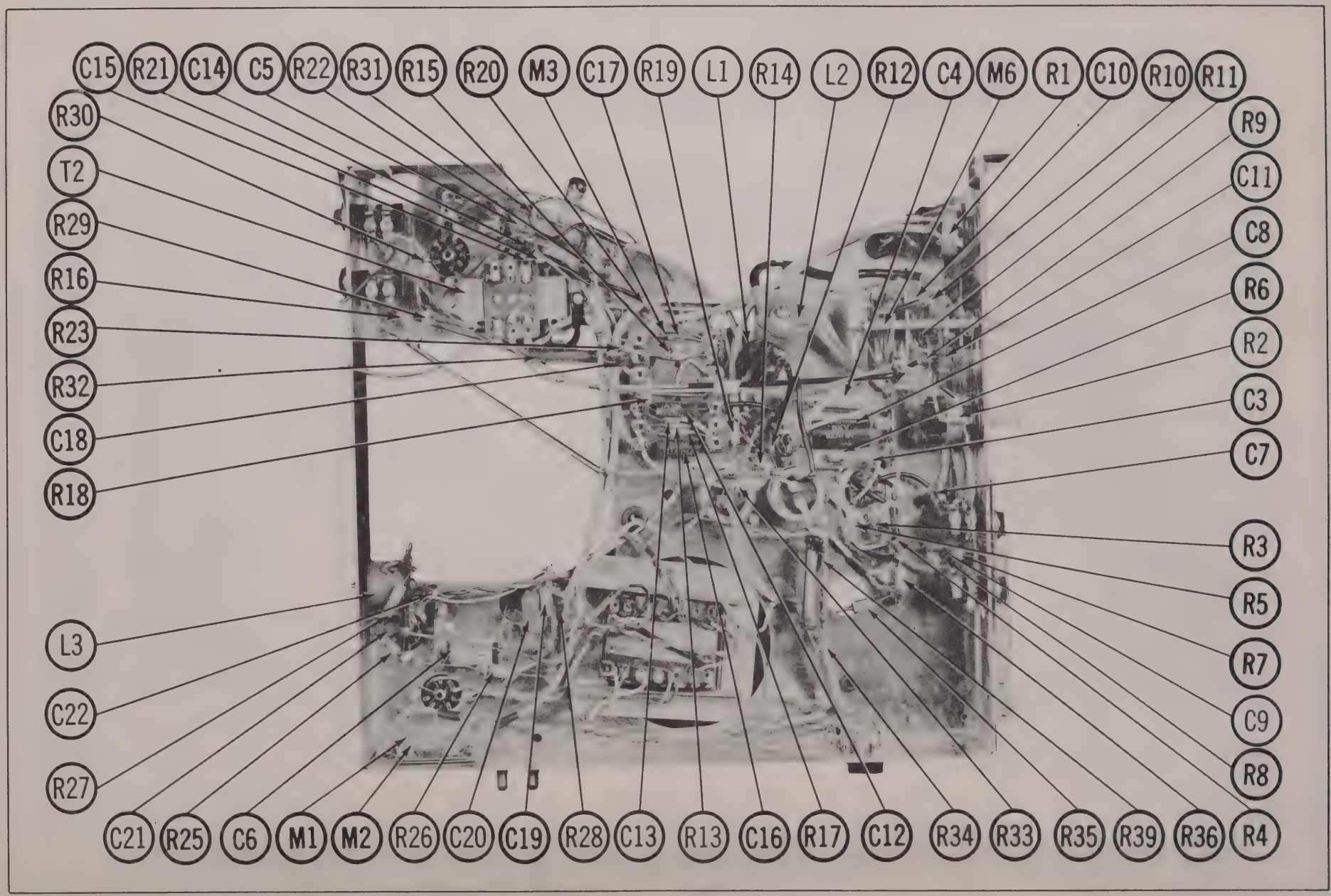
CHASSIS TOP VIEW - "B" UNIT (AUX AMP)



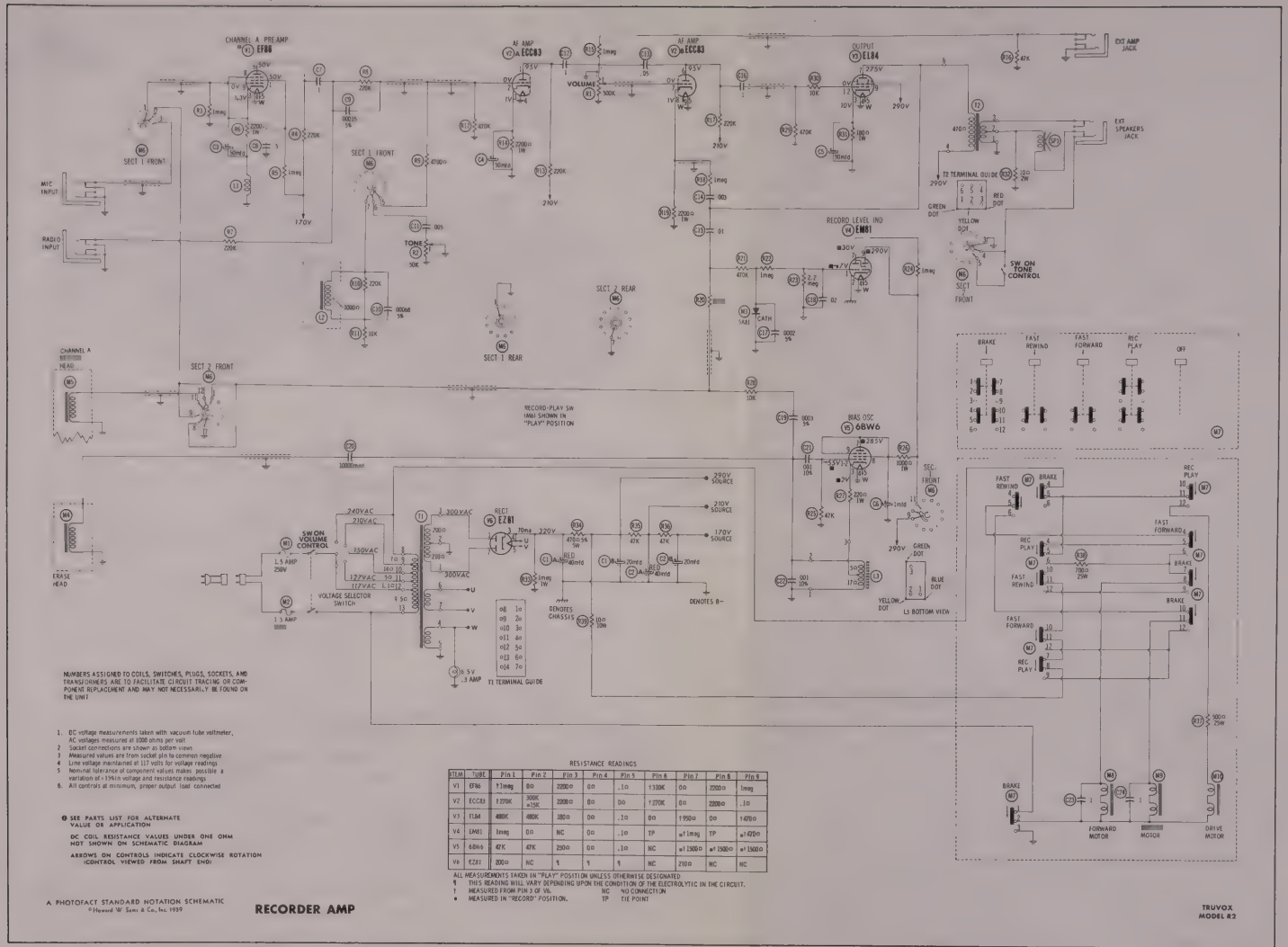
CHASSIS BOTTOM VIEW - "B" UNIT (AUX AMP)

MODEL R2

TRUVOX



CHASSIS BOTTOM VIEW - "A" UNIT (RECORDER AMP)



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86	↑1meg	0Ω	2200Ω	0Ω	.1Ω	↑330K	0Ω	220Ω	1meg
V2	ECC83	↑270K	300K ±15K	220Ω	0Ω	0Ω	↑270K	0Ω	220Ω	.1Ω
V3	EL84	480K	480K	180Ω	0Ω	.1Ω	0Ω	↑950Ω	0Ω	↑470Ω
V4	EM81	1meg	0Ω	NC	0Ω	.1Ω	TP	≠1meg	TP	≠470Ω
V5	6BW6	47K	47K	250Ω	0Ω	.1Ω	NC	≠1500Ω	≠1500Ω	≠1500Ω
V6	EZ81	200Ω	NC	¶	¶	¶	NC	210Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 3 OF V6. NC NO CONNECTION
● MEASURED IN "RECORD" POSITION. TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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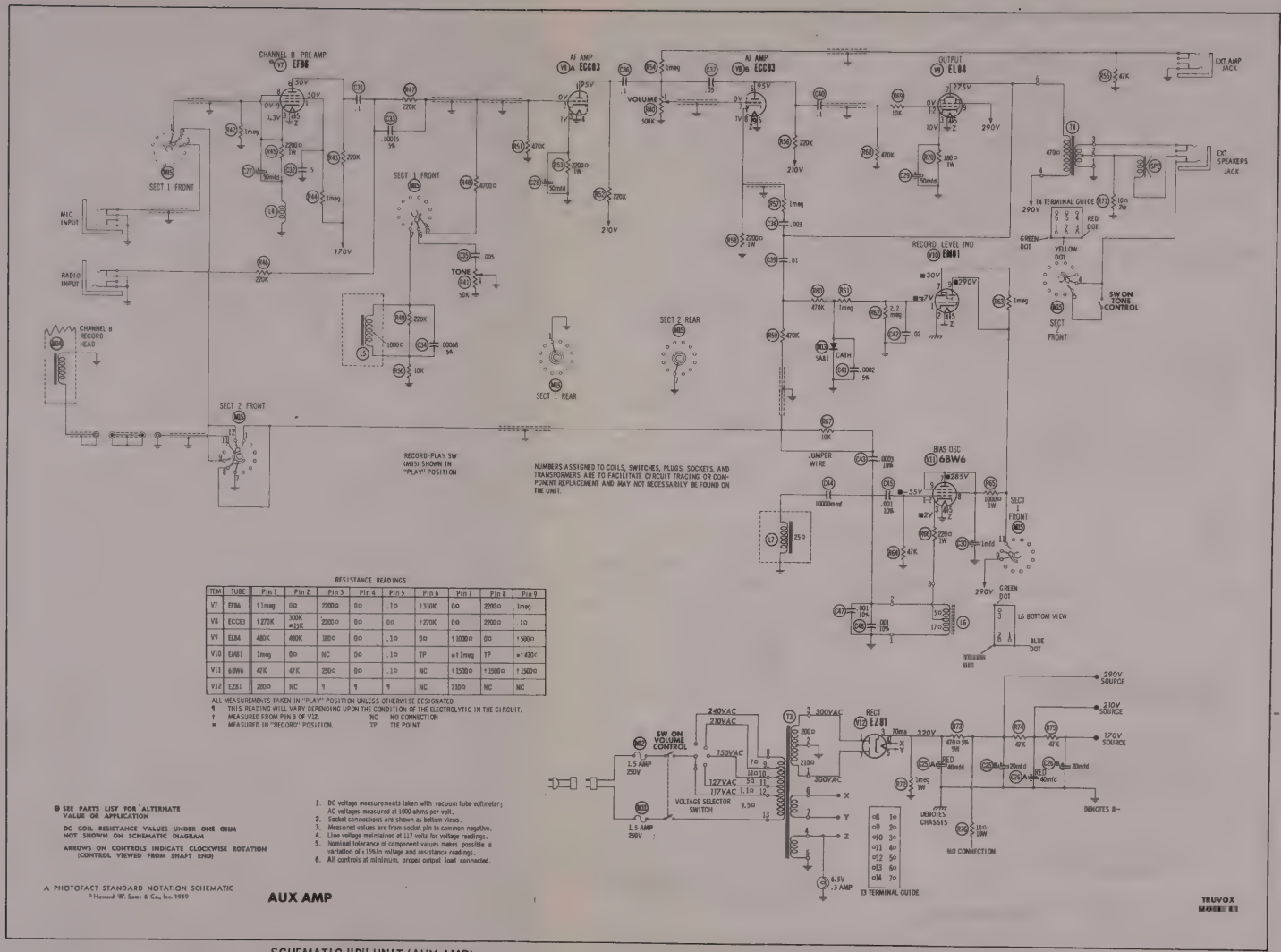
RECORDER AMP

TRUVOX MODEL R2

SCHEMATIC "A" UNIT (RECORDER AMP)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V7	EF86	↑1meg	0Ω	2200Ω	0Ω	.1Ω	↑330K	0Ω	2200Ω	1meg
V8	ECC83	↑270K	300K ▪33K	2200Ω	0Ω	0Ω	↑270K	0Ω	2200Ω	.1Ω
V9	EL84	480K	480K	180Ω	0Ω	.1Ω	0Ω	↑1000Ω	0Ω	↑500Ω
V10	EM81	1meg	0Ω	NC	0Ω	.1Ω	TP	▪1meg	TP	▪1470K
V11	6BW6	47K	47K	250Ω	0Ω	.1Ω	NC	↑1500Ω	↑1500Ω	↑1500Ω
V12	EZ81	200Ω	NC	¶	¶	¶	NC	210Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 3 OF V12. NC NO CONNECTION
▪ MEASURED IN "RECORD" POSITION. TP TIE POINT

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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AUX AMP

TRUVOX MODEL 81

SCHEMATIC "B" UNIT (AUX AMP)

PHOTOFACT* Folder with CIRCUITRACE*

WEBCOR MODELS CP-1953-1, EP-1953-1, CP-1991-1, EP-1991-1 (Ch. 14X278-1, -2, 73X014-1)

WEBCOR MODELS CP-1953-1, EP-1953-1, CP-1991-1, EP-1991-1 (Ch. 14X278-1, -2, 73X014-1)

MODEL EP1991-1

TRADE NAME	Webcor Models CP-1953-1, EP-1953-1 (Amp. 14X278-1); CP-1991-1, EP-1991-1 (AM Tuner 73X014-1,
MANUFACTURER	Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois Amp. 14X278-2)
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer (Model 1991 Series Has 2 Tube AM Tuner)
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	26 Watts, .28 Amp. @ 117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	535 - 1620KC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE WEBCOR 170 - PHOTOFACT SET 447 FOLDER 13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

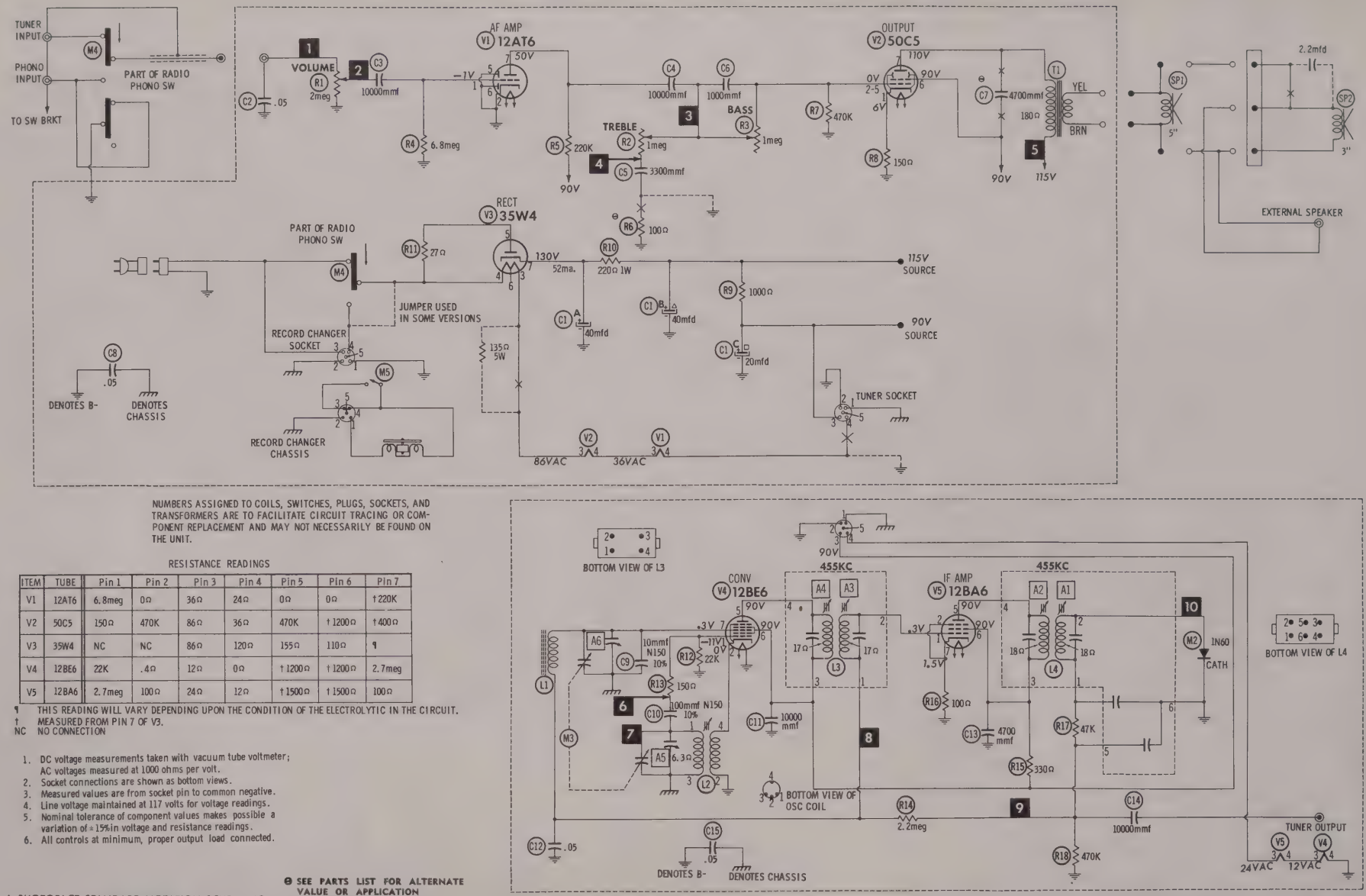
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully closed	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JP342

SET 468 FOLDER 17



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AT6	6.8meg	0Ω	36Ω	24Ω	0Ω	0Ω	†220K
V2	50C5	150Ω	470K	86Ω	36Ω	470K	†1200Ω	†400Ω
V3	35W4	NC	NC	86Ω	120Ω	155Ω	110Ω	¶
V4	12BE6	22K	.4Ω	12Ω	0Ω	†1200Ω	†1200Ω	2.7meg
V5	12BA6	2.7meg	100Ω	24Ω	12Ω	†1500Ω	†1500Ω	100Ω

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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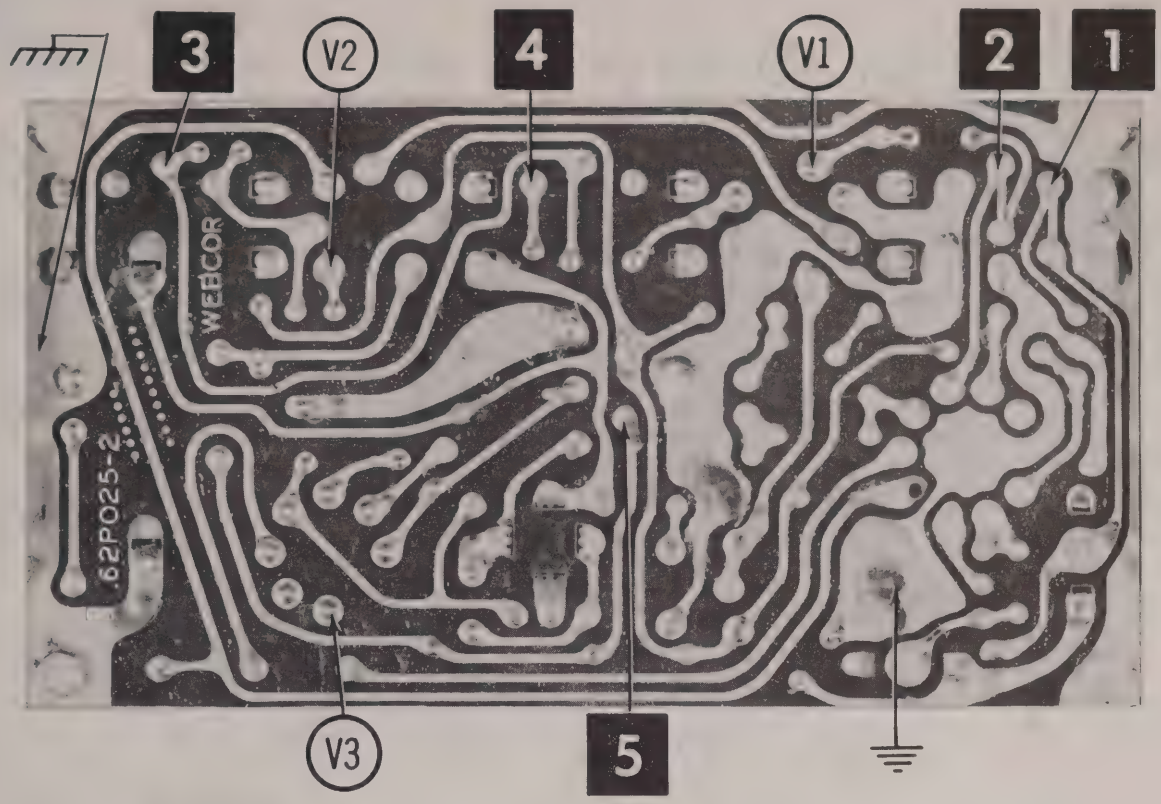
WEBCOR MODELS CP-1953-1, EP-1953-1, CP-1991-1, EP-1991-1 (Ch. 14X278-1, -2, 73X014-1)



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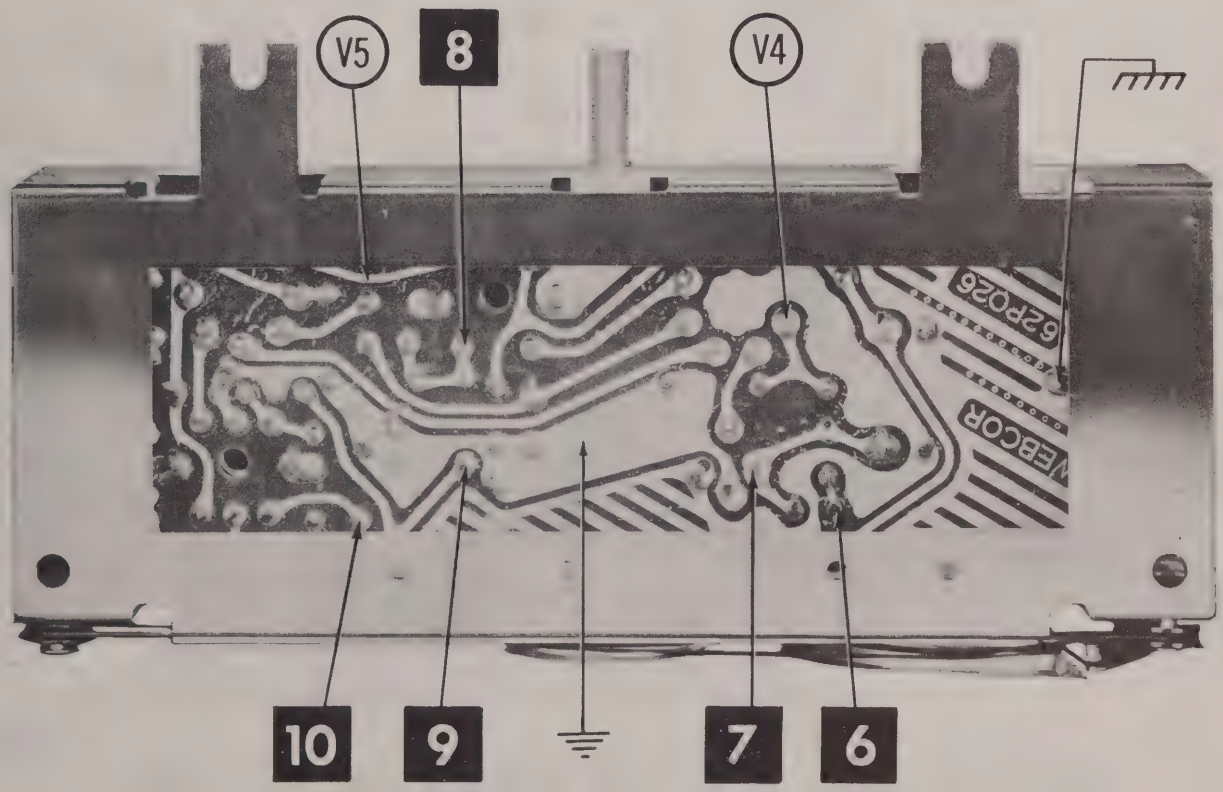
AMPLIFIER
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A Howard W. Sams CIRCUITRACE® Photo

AM TUNER
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	AF Amplifier	12AT6
V2	Output	50C5
V3	Rectifier	35W4
V4	Converter	12BE6
V5	IF Amplifier	12BA6

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2meg	1/2	31P138					Volume
R2	1meg	1/2	31P139					Treble
R3	1meg	1/2	31P139					Bass

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	30P258	AFH3-11-30	C0090 ‡	PFP311.63		PCL-3439	
B	▲40	150							
C	■20	150							

‡ Use printed circuit adaptor #55277 and 55278.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	6.8meg	
R5	220K	
R6	100Ω	Note 1
R7	470K	
R8	150Ω	

ITEM No.	RATING	REMARKS
R9	1000Ω	
R10	220Ω 1W	
R11	27Ω	
R12	22K	
R13	150Ω	

ITEM No.	RATING	REMARKS
R14	2.2meg	
R15	330Ω	
R16	100Ω	
R17	47K	
R18	470K	

Note 1. Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400		30P283	P415IN-047	DD-503	BC6S47J	ACE6147	4SE-S47	
C3	10000			30P254	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C4	10000			30P254	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C5	3300			30P253	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	
C6	1000			30P351	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C7	4700			30P346	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	①
C8	.05	400		30P283	P415IN-047	DD-503	BC6S47J	ACE6147	4SE-S47	
C9	10		N150 10%	30P349						
C10	100		N150 10%	30P282						
C11	10000			30P254	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	.05	400		30P283	P4151-047	DD-503	BC6S47J	ACE6147	4SE-S47	
C13	4700			30P346	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C14	10000			30P254	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	.05	400		30P283	P4151-047	DF-503	BC6S47J	ACE6147	4SE-S47	

① Not used in Model 1991.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		WEBCOR PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	65P147						
L2	Osc. Coil	65P146						
L3	Input IF	69P021	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	69P022						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	67P064	22S46 ①	A-2928 ①	AU-603 ①	A-3876 ①	22S46 ①	S-1X ①	①Use original frame.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	76P075-2	5AQ5	
SP2	3"	PM	3-4Ω	76P074	3AQ7	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	WEBCOR PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	A1919	91-T	Not Req.						

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		WEBCOR PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	65P119	1N60	1N60	1N60	AM Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	WEBCOR PART No.	NOTES
M3	Tuning Cap.	30P347	2 Gang
M4	Switch	32P135	Radio-Phono
M5	Switch		On-Off-Reject (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Tuning Knob Ass'y	49X331	
Knob	39P205-4	Volume, Model 1991
Knob	39P205-1	Volume, Model 1953
Knob	39P205-5	Treble, Model 1991
Knob	39P205-2	Treble, Model 1953

CABINETS & CABINET PARTS (cont)

NAME	PART NO.	DESCRIPTION
Knob	39P205-6	Bass, Model 1991
Knob	39P205-3	Bass, Model 1953
Dial Pointer	45P2634	
Case	92X082-2	Black, Model 1991
Case	92X082-1	Coral, Model 1991
Case	92X081-2	Black, Model 1953
Case	92X081-1	Coral, Model 1953
Tube Service Panel	110P117-2	Black, Model 1991
Tube Service Panel	110P108-2	Black, Model 1953
Handle	39P049-1	Black
Handle	39P049-6	Grey

WIRING DATA

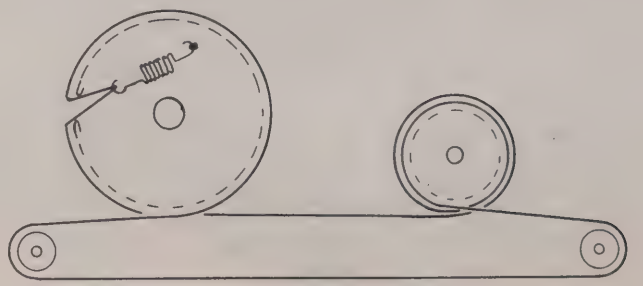
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

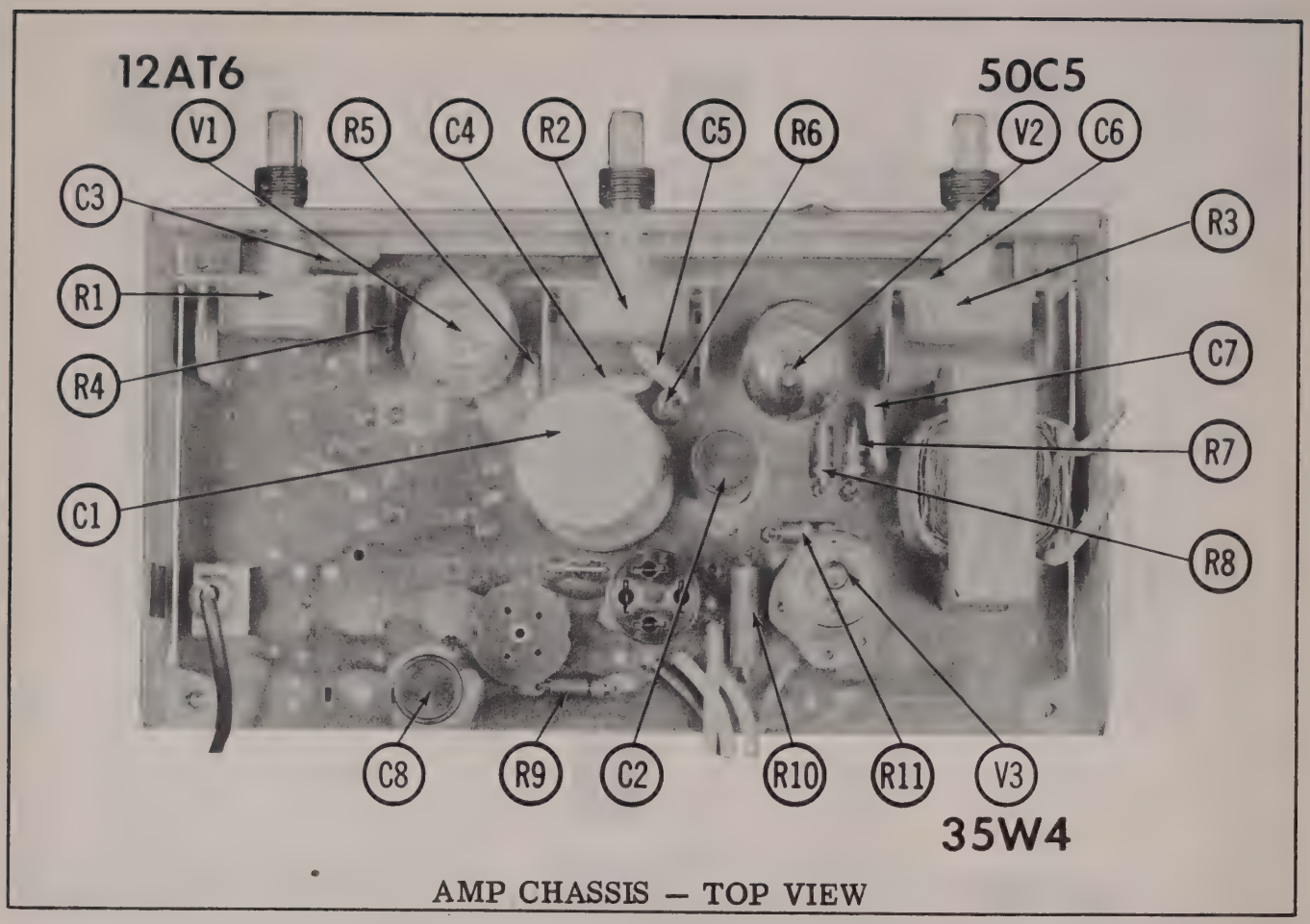
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

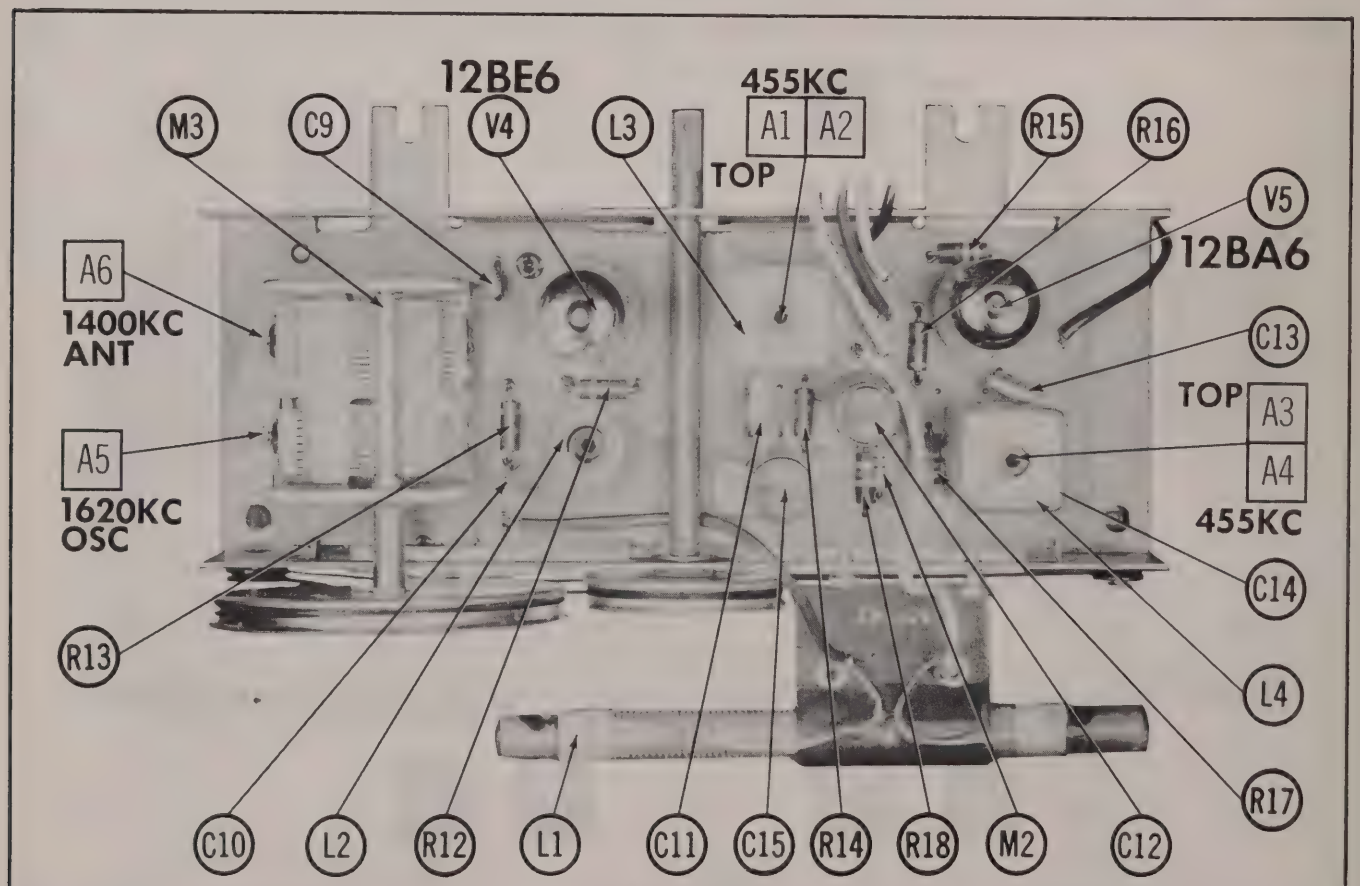
TUNING GANG FULLY CLOSED



DIAL CORD STRINGING



AMP CHASSIS – TOP VIEW



AM TUNER CHASSIS – TOP VIEW

PHOTOFACT* Folder with CIRCUITRACE*

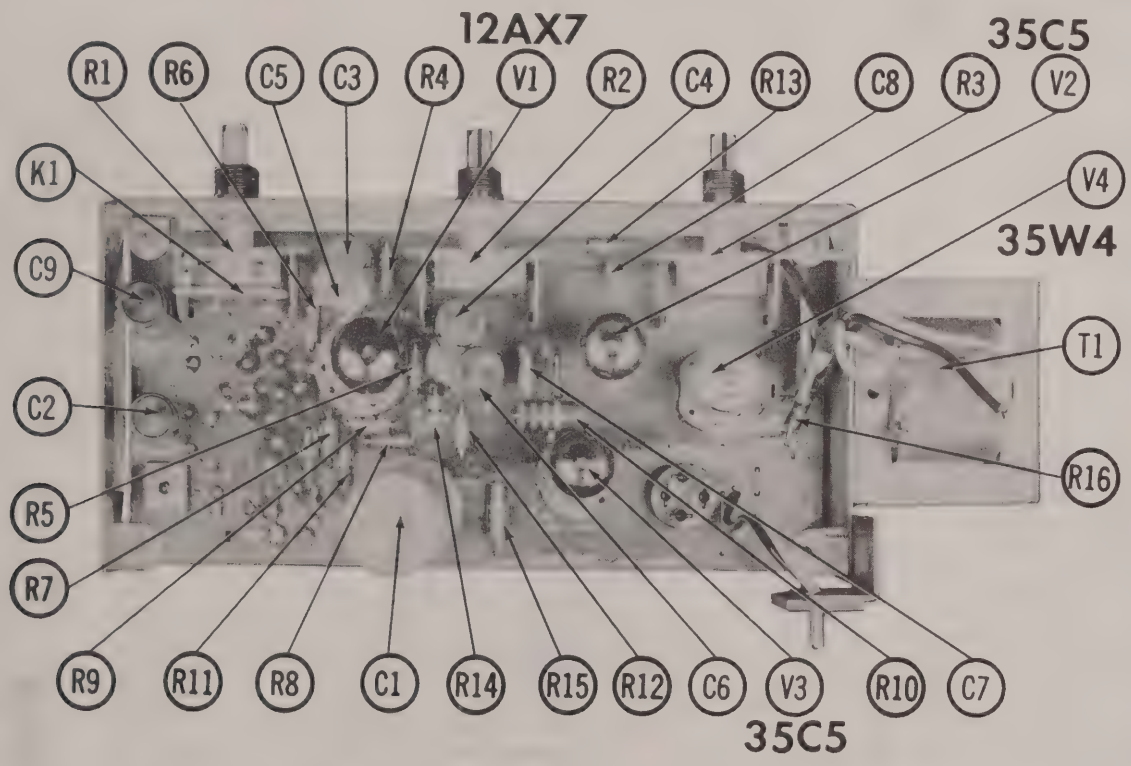
WEBCOR MODELS 1954-1, -1A, 1963-1 (Ch. 14X263-1, 280-2)

WEBCOR MODELS 1954-1, -1A, 1963-1 (Ch. 14X263-1, 280-2)

MODEL TP1963-1

TRADE NAME	Webcor Models EP1954-1, -1A, TP1954-1, -1A, EP1963-1, TP1963-1 (Ch. 14X263-1, 14X280-2)
MANUFACTURER	Webcor Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois
TYPE SET	AC Operated 4 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 28 Watts, .30 Amp. @117 Volts (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE WEBCOR 168 — PHOTOFACT SET 447 FOLDER 13



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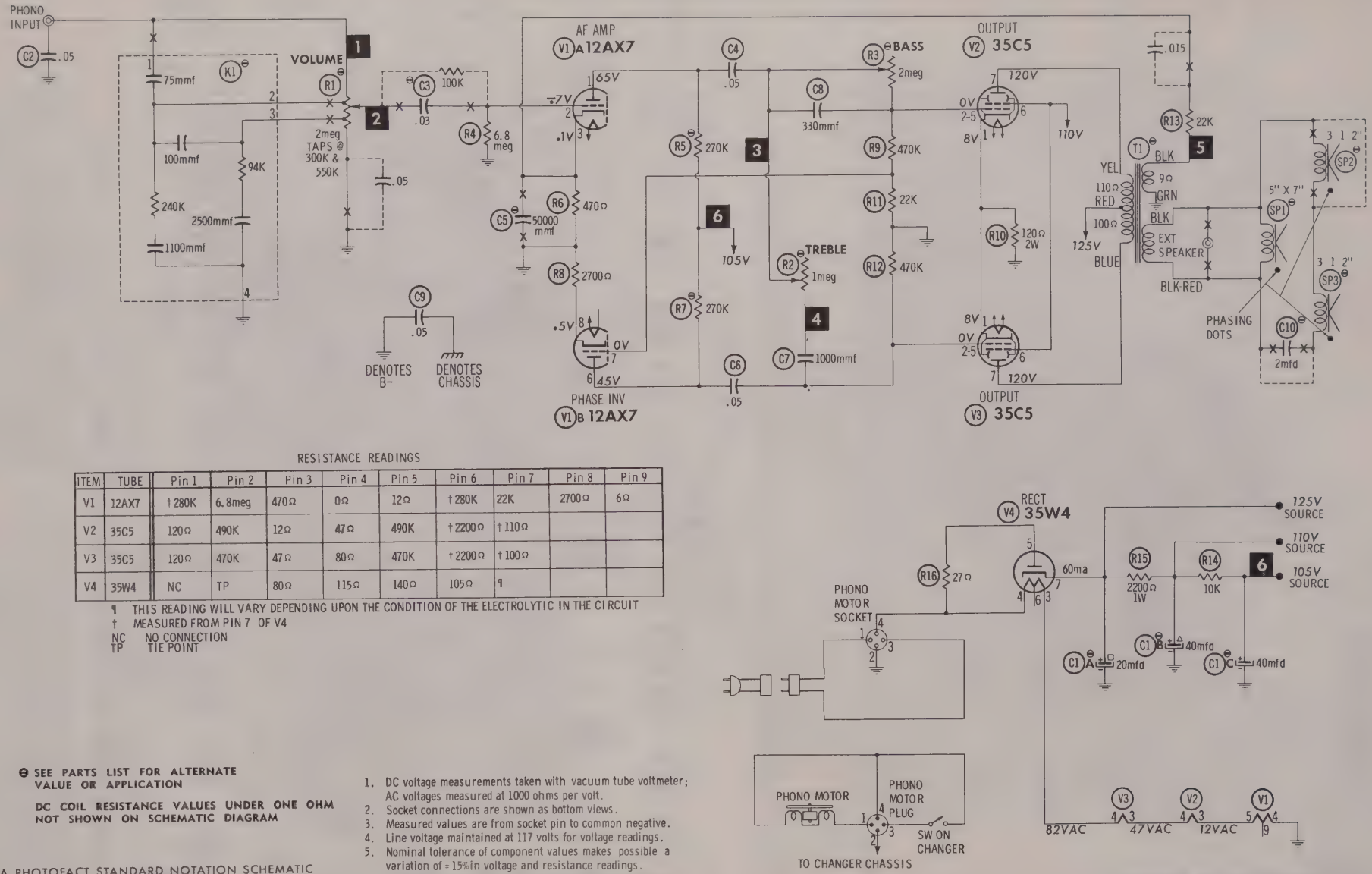
JS352

SET 468 FOLDER 18



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†280K	6.8meg	470Ω	0Ω	12Ω	†280K	22K	2700Ω	6Ω
V2	35C5	120Ω	490K	12Ω	47Ω	490K	†2200Ω	†110Ω		
V3	35C5	120Ω	470K	47Ω	80Ω	470K	†2200Ω	†100Ω		
V4	35W4	NC	TP	80Ω	115Ω	140Ω	105Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
† MEASURED FROM PIN 7 OF V4
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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WEBCOR MODELS 1954-1, -1A, 1963-1 (Ch. 14X263-1, 280-2)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		◆ RAYTHEON ◆		◆ SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE		
V1	AF Amp. -Phase Inv.	12AX7	V3	Output	35C5		
V2	Output	35C5	V4	Rectifier	35W4		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■20	150	30P258	AFH3-11-30	C0090 ǂ	PFP311.63		PCL-3439	①
B	▲40	150							
C	40	150							

ǂ Use printed circuit adaptor #55277 and 55278.
① Part #30P250 40mfd, 60mfd, 20mfd@150V is used in Ch. 14X263-1.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P415IN-047	DF-503	BC6S47J	4DP-3-503	ACE6147	4SE-S47
C3	.03 400V	①	P415I-033	DF-303	BC6S33J	4DP-2-303	ACE6133	4SE-S33
C4	.05 400V		P415IN-047	DF-503	BC6S47J	4DP-3-503	ACE6147	4SE-S47
C5	50000 100V	①	BPD-05·	DF-503	CUB2S5	1DP-2-503	BT-150	5HK-S50
C6	.05 400V		P415IN-047	DF-503	BC6S47J	4DP-3-503	ACE6147	4SE-S47
C7	1000		BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D10
C8	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	5GA-T33
C9	.05 400V		P415IN-047	DF-503	BC6S47J	4DP-3-503	ACE6147	4SE-S47
C10	2mfd 25V	②	P282Z-2.0		MP2W2			118P20502S2

① Not used in Ch. 14X263-1.
② Used in Ch. 14X280-2 only.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2meg *		31P140					Volume ①
R2	1meg		31P139					Treble ②
R3	2meg		31P138					Bass ②

* Tap@300K & 550K.
① Chassis 14X263-1 uses 2meg untapped volume, Part #31P115.
② Chassis 14X263-1 uses 2meg Bass, 1meg Treble, dual, Part #31P111.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	6.8meg	
R5	270K	Note 1
R6	470Ω	
R7	270K	Note 1
R8	2700Ω	

ITEM No.	RATING	REMARKS
R9	470K	
R10	120Ω 2W	
R11	22K	
R12	470K	
R13	22K	

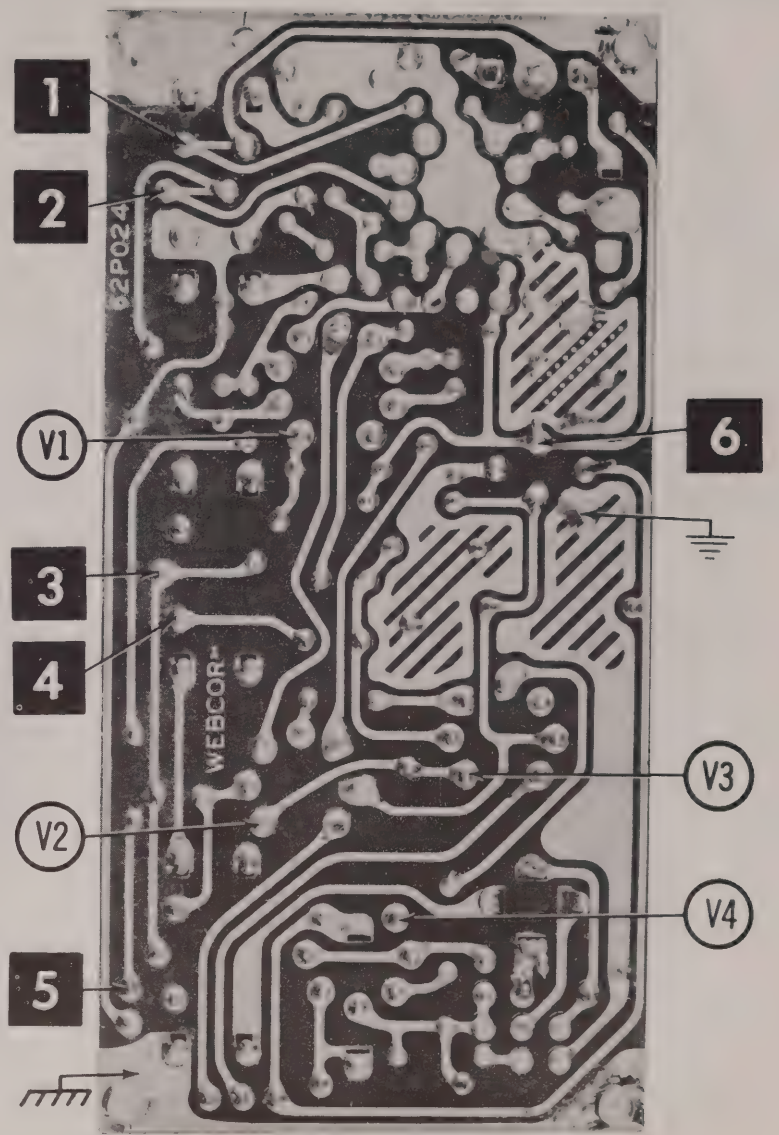
ITEM No.	RATING	REMARKS
R14	10K	
R15	2200Ω 1W	
R16	27Ω	

Note 1. Ch. 14X263-1 uses 220K in this application.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	WEBCOR PART No.	REPLACEMENT DATA
K1	Input Comp.	75mmf, 100mmf, 1100mmf, 2500mmf, 94K, 240K	62P017 *	

* Not used in Chassis 14X263-1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.[1]	REPLACEMENT DATA WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4600Ω CT	9Ω SEC. 2 6-8Ω	67P066 ①							

① Ch. 14X280-1, 14X280-2. Ch. 14X263-1 uses Part #67P058.

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA WEBCOR PART No.	QUAM PART No.	NOTES
SP1	5"x 7"	PM	6-8Ω	76P078①	57A1Z7.4	① Model 1963
SP2	3½"	PM	3-4Ω	76P077-1①	3AQ7	
SP3	3½"	PM	3-4Ω	76P077-1①	3AQ7	② Model 1954-1
	6"	PM		76P066②		③ Model 1954-1A
	6"	PM		76P079③		
	4"	PM		76P065②		
	4"	PM		76P077-2③		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA WEBCOR PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	21P586	* 13TB	Not Req.	66 ǂ	Not Req.			8TA4-S * or 8TA4-D *	Not Req.

* Includes Mounting.
ǂ Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA WEBCOR PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M2		* W-204DS †♦ or * W-204DD-1♦		† Jewel ♦ Diamond * Includes Cartridge

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	39P148-10C	Model TP1963
Knob	39P148-10T	Model EP1963
Knob	39P171-T	Volume, Black, Model 1954-1
Knob	39P205-7	Volume, Black, Model 1954-1A
Knob	39P171-LS	Volume, Clear, Model 1954-1
Knob	39P205-10	Volume, Brown, Model 1954-1A
Knob	39P165-5T	Treble, Black, Model 1954-1
Knob	39P205-8	Treble, Black, Model 1954-1A
Knob	39P165-5LS	Treble, Tan, Model 1954-1
Knob	39P205-11	Treble, Brown, Model 1954-1A
Knob	39P141-T	Bass, Black, Model 1954-1
Knob	39P205-9	Bass, Black, Model 1954-1A
Knob	39P141-LS	Bass, Clear, Model 1954-1
Knob	39P205-12	Bass, Brown, Model 1954-1A
Cabinet	92X085-1	Model TP1963
Cabinet	92X063-1	Ebony, Model 1954-1
Cabinet	92X085-2	Model EP1963
Cabinet	92X099-1	Ebony, Model 1954-1A
Cabinet	92X063-2	Tan, Model 1954-1
Cabinet	92X099-2	Brown, Model 1954-1A
Handle	39P184-5	Model TP1963, 1954-1A
Handle	39P184-4	Model EP1963, 1954-1A
Handle	39P184-1	Grey, Model 1954-1
Handle	39P184-2	Tan, Model 1954-1

WIRING DATA

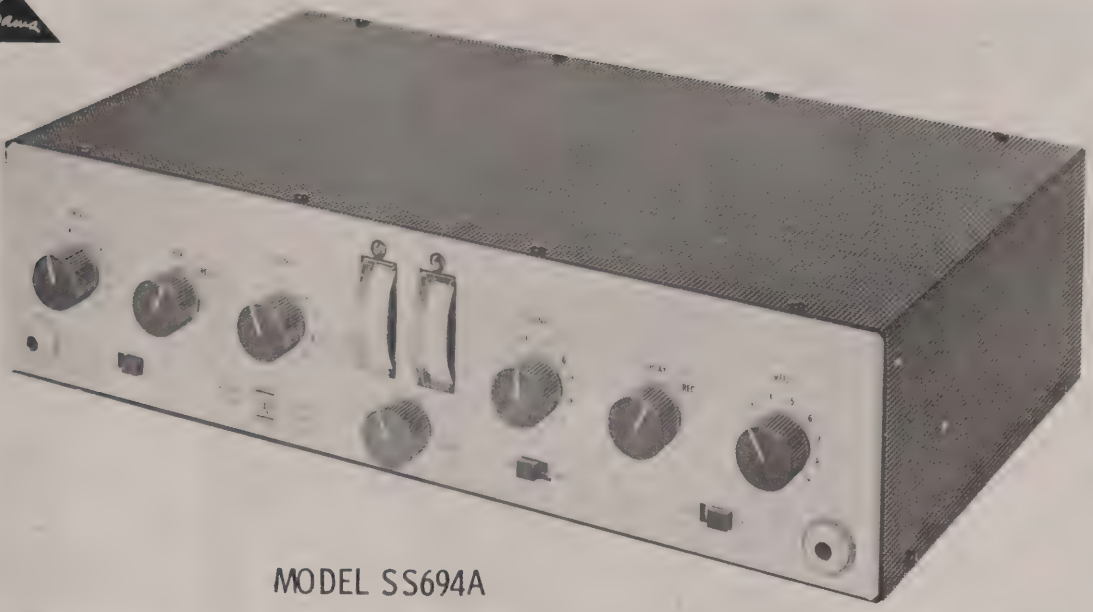
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

WEBSTER ELECTRIC
MODELS SS694A, SS694B

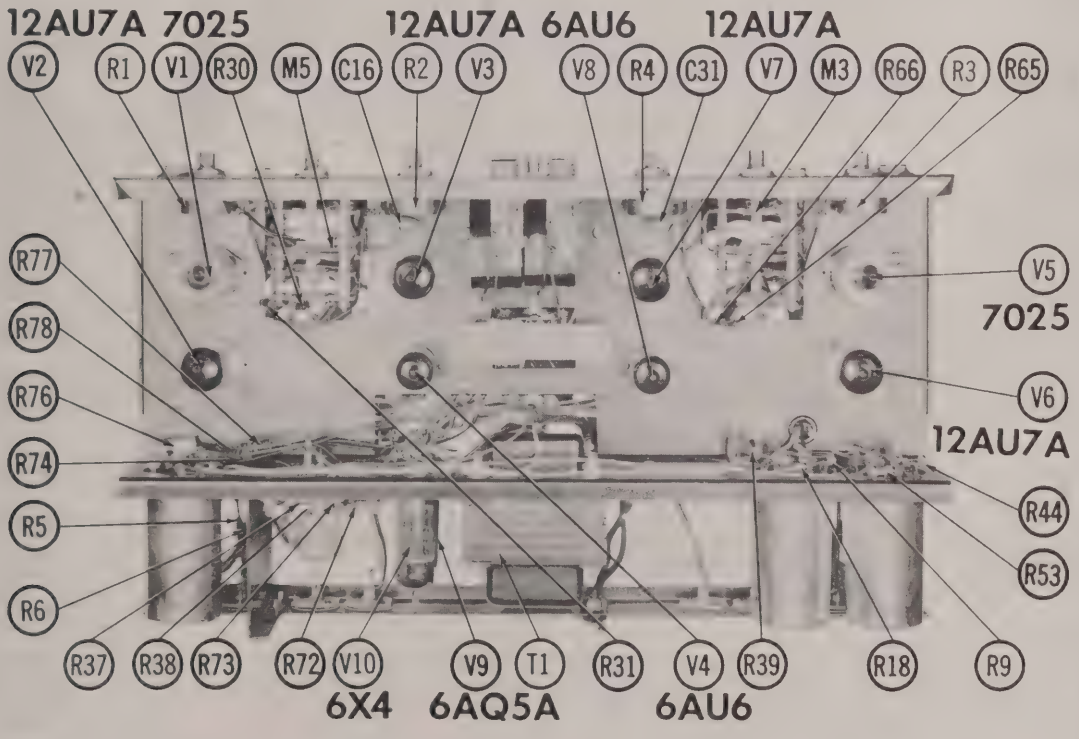
WEBSTER ELECTRIC
MODELS SS694A, SS694B



MODEL SS694A

WEBSTER ELECTRIC
MODELS SS694A, SS694B

TRADE NAME	Webster Electric Models SS694A, SS694B
MANUFACTURER	Webster Electric Co., Racine, Wisconsin
TYPE SET	AC Operated 10 Tube Record-Playback Stereo Preamplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 39 Watts, .41 Amp. @ 117 Volts AC (Play) 48 Watts, .49 Amp. @ 117 Volts AC (Record)



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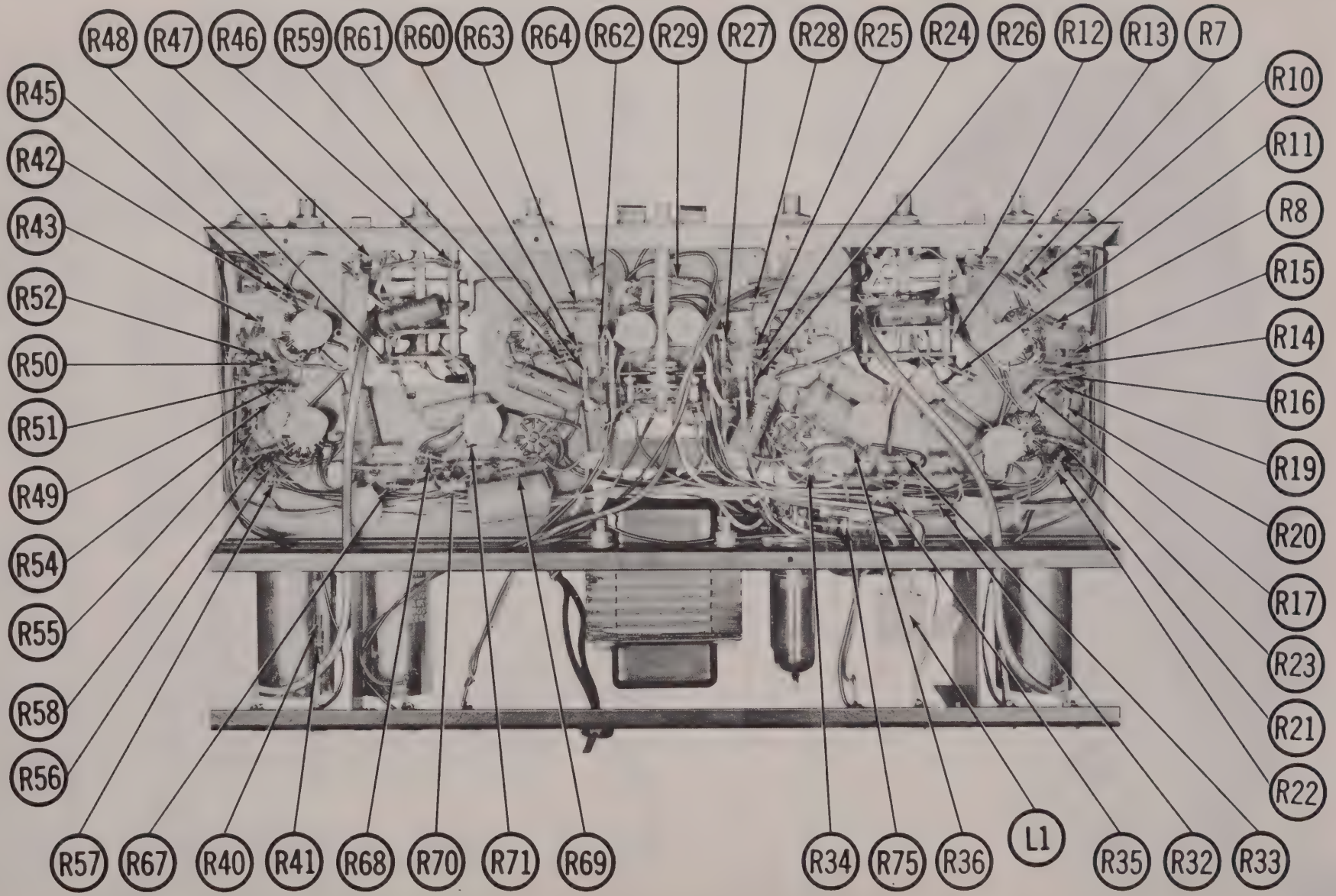
JQ399

SET 468 FOLDER 19



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Right Channel Preamplifier	7025	V6	Left Channel AF Amp.	12AU7A
V2	Right Channel AF Amp.	12AU7A	V7	Left Channel Meter Amp. - Left Channel Cathode Follower	12AU7A
V3	Right Channel Meter Amp. - Right Channel Cath. Follower	12AU7A	V8	Left Channel Record Amp.	6AU6
V4	Right Channel Record Amp.	6AU6	V9	Bias Oscillator	6AQ5A
V5	Left Channel Preamplifier	7025	V10	Rectifier	6X4

CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	WEBSTER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	241-14236	AFH2-57	B0450	FP238	TMD-54	TVL-2764	
B	▲40	450							
C2A	▲20	350	241-26133	AFH4-06	C0290	FP444.8	TMQ-7	TVL-4672	Note 1
B	20	350			BR2035				
C	■35	350							
D	▲35	350							
C3A	▲20	350	241-26133	AFH4-06	D0174	FP444.8	TMQ-7	TVL-4672	Note 1
B	20	350							
C	■35	350							
D	▲35	350							
C4	5	50		PRS1310	BBR5-50	TC30	TD-5-50	TVA-1303	
C5	5	50		PRS1310	BBR5-50	TC30	TD-5-50	TVA-1303	

Note 1. A 3 section 40-35-35mfd may be used in some versions.

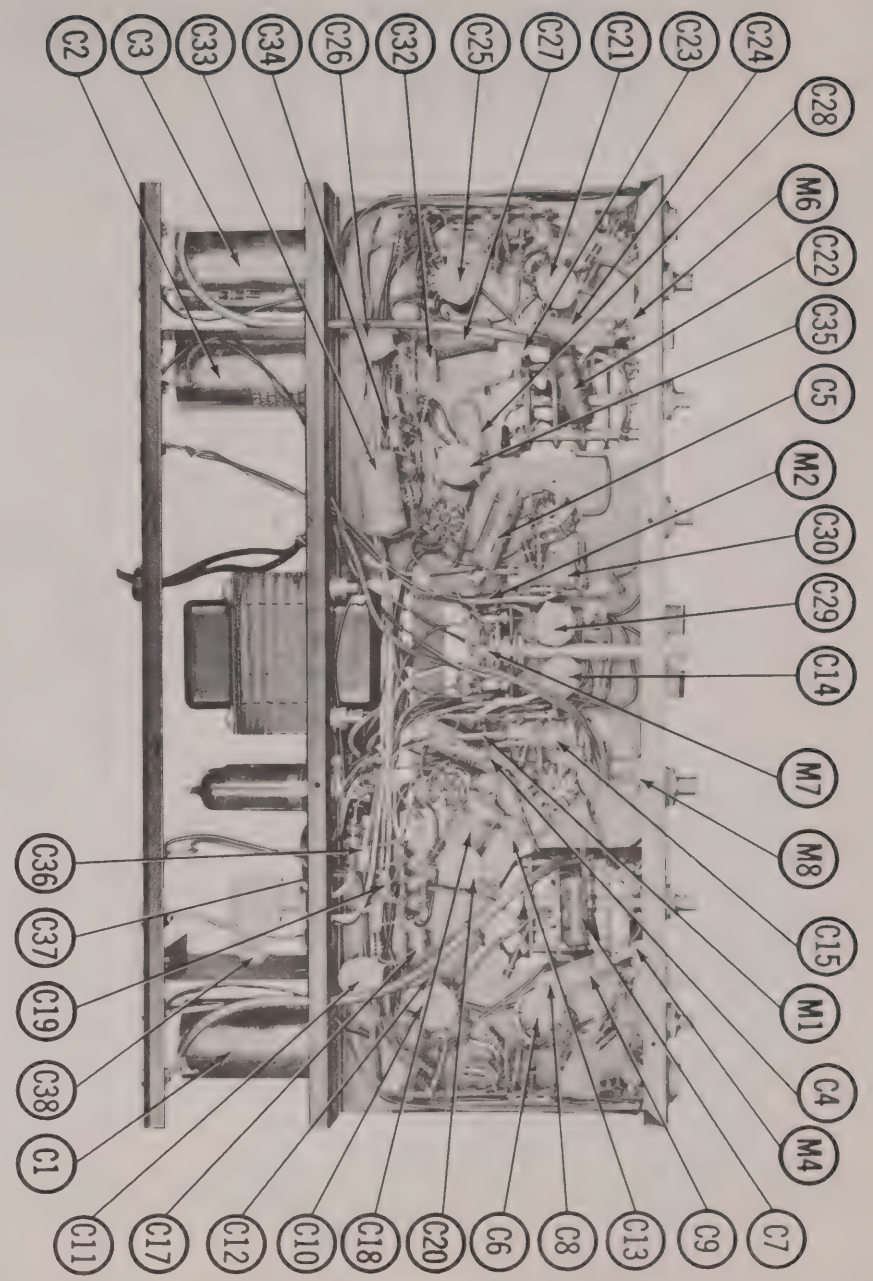
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C7	.033 400V	Note 1	P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33
C8	1000 10%		DI-1000	DD-102	PM6D1	CCS-102	JL-210	10TS-D10
C9	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C12	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C13	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C15	.1 200V		P288N-1	DF-104	CUB2P1	2PD-3-104	GEM-201	2TM-P1
C16	3000		BPD-003	D6-302	BYA10D3	CCD-302	UC-523	10TS-D30
C17	100		SI 100	D6-101	L10T1	CCD-101	UC-531	10TS-T10
C18	.2 400V		P488N-2		CUB4P2	4DP-4-204	GEM-402	4TM-P2
C19	200		SI 200	D6-201	L10T2	CCD-201	UC-532	10TS-T20
C20	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C21	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C22	.033 400V	Note 1	P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33
C23	1000 10%		DI-1000	DD-102	PM6D1	CCS-102	JL-210	10TS-D10
C24	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C26	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C27	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C28	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C29	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C30	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C31	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	10TS-D30
C32	100		SI 100	D6-101	L10T1	CCD-101	UC531	10TS-T10
C33	.2 400V		P488N-2		CUB4P2	4DP-4-204	GEM-402	4TM-P2
C34	200		SI 200	D6-201	L10T2	CCD-201	UC532	10TS-T20
C35	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C36	3000		SI 3000	D6-302	BYA10D3	CCD-302	UC-523	10TS-D30
C37	3000		SI 3000	D6-302	BYA10D3	CCD-302	UC-523	10TS-D30
C38	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20

Note 1. Model SS695B uses .022mfd in this application.

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBSTER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1/2	S3911	AB-60	A47-500K-Z	Q13-133	U48	Volume, Right Channel
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R2A	50K	1/2	S4180-1	AB-32	A47-50K-Z	Q13-123	U33	Tone, Right Channel
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R3A	500K	1/2	S3911	AB-60	A47-500K-Z	Q13-133	U48	Volume, Left Channel
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R4A	50K	1/2	S4180-1	AB-32	A47-50K-Z	Q13-123	U33	Tone, Left Channel
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	510K 5%	
R6	10K	
R7	1meg	
R8	100K 5%	
R9	100K 5%	
R10	2000Ω 5%	
R11	75K 5%	
R12	100K 5%	
R13	75K 5%	
R14	510K 5%	
R15	100K 5%	
R16	2000Ω 5%	
R17	51K 5%	
R18	10K	
R19	1300Ω 5%	
R20	100K 5%	
R21	510K 5%	
R22	36K 5%	
R23	2000Ω 5%	
R24	1meg	
R25	5100Ω 5%	
R26	2000Ω 5%	
R27	300Ω 5%	
R28	2000Ω 5%	
R29	51K 5%	

ITEM No.	RATING	REMARKS
R30	1.5meg	
R31	360K 5%	
R32	510K 5%	
R33	82K 5%	
R34	51K 5%	
R35	100K 5%	
R36	2200Ω	
R37	105K 5%	(62K) *
R38	240K 5%	
R39	5100Ω 5% 1W	
R40	510K 5%	
R41	10K	
R42	1meg	
R43	100K 5%	
R44	100K 5%	
R45	2000Ω 5%	
R46	75K 5%	
R47	100K 5%	
R48	75K 5%	
R49	510K 5%	
R50	100K 5%	
R51	2000Ω 5%	
R52	51K 5%	
R53	10K	
R54	1300Ω 5%	

ITEM No.	RATING	REMARKS
R55	100K 5%	
R56	510K 5%	
R57	36K 5%	
R58	2000Ω 5%	
R59	1meg	
R60	5100Ω 5%	
R61	2000Ω 5%	
R62	300Ω 5%	
R63	2000Ω 5%	
R64	51K 5%	
R65	1.5meg	
R66	360K 5%	
R67	510K 5%	
R68	82K 5%	
R69	51K 5%	
R70	100K 5%	
R71	2200Ω	
R72	150K 5%	(62K) *
R73	240K 5%	
R74	5100Ω 5% 1W	
R75	10K 1W	
R76	500Ω 5W	
R77	120K 1W	
R78	3600Ω 5%	

* Used in Model SS695B.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		WEBSTER PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Bias Osc.	241-14246-1						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	WEBSTER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.
T1	117V@ .49A	560 VCT @.055A	6.3V@ .6A	242-26294						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @2.8A									

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		WEBSTER PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M1	1N65		1N65	1N60	1N60	Left Meter Rect. (Pigtail)
M2	1N65		1N65	1N60	1N60	Right Meter Rect.(Pigtail)

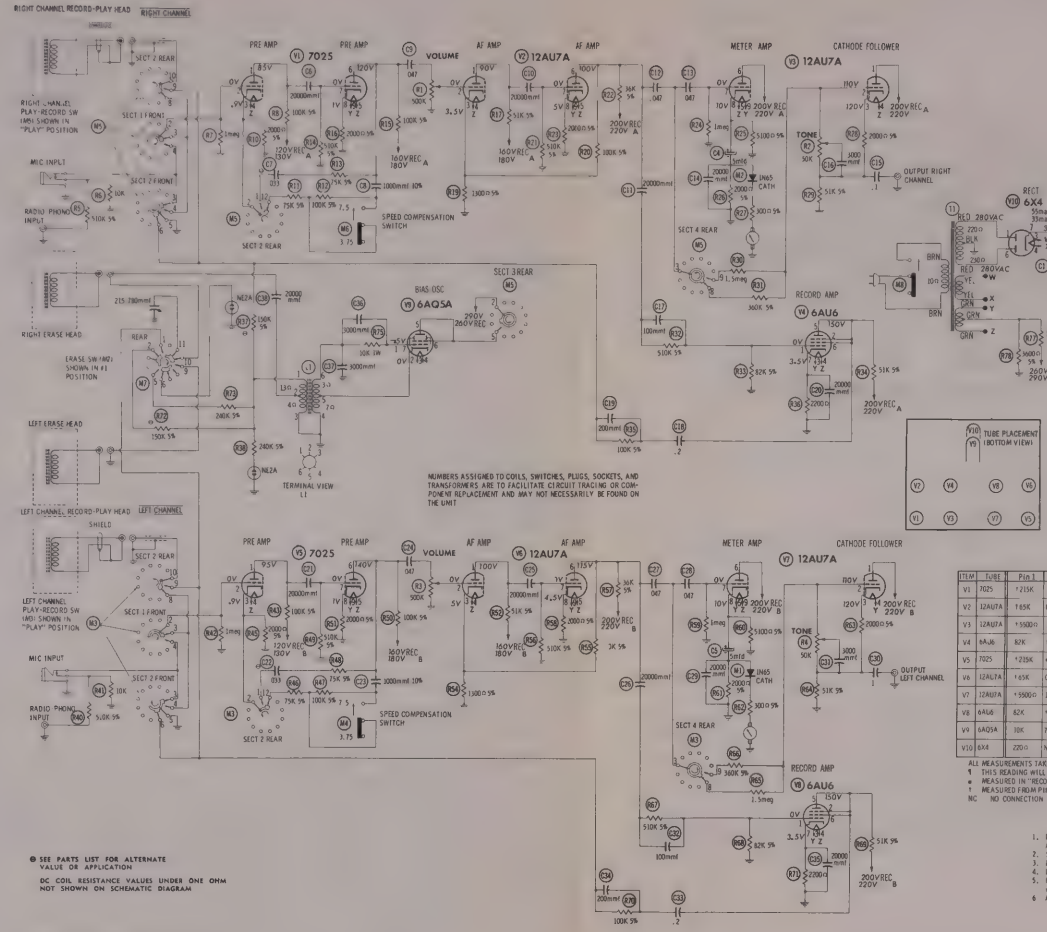
MISCELLANEOUS

ITEM No.	PART NAME	WEBSTER PART No.	NOTES
M3	Switch		Play-Record, Left Amp.
M4	Switch		Speed Compensating, Left. Amp. (SPDT, Slide Type)
M5	Switch		Play-Record, Right Amp.
M6	Switch		Speed Compensating, Right Amp. (SPDT, Slide Type)
M7	Switch		Erase
M8	Switch		Off-On (SPST, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	*215K	*10K	2000Ω	360Ω	360Ω	*115K	510K	2000Ω	360Ω
V2	12AU7A	†65K	0Ω	1300Ω	360Ω	360Ω	*40K	510K		
V3	12AU7A	*550Ω	100K	55K	360Ω	360Ω	*550Ω	1meg	510Ω	360Ω
V4	6AU6	82K	*55K	360Ω	360Ω	*55K	*55K	2200Ω		
V5	7025	*215K	*10K	2000Ω	360Ω	360Ω	*115K	510K	2000Ω	360Ω
V6	12AU7A	†65K	0Ω	1300Ω	360Ω	360Ω	*40K	510K	2000Ω	360Ω
V7	12AU7A	*550Ω	100K	55K	360Ω	360Ω	*550Ω	1meg	510Ω	360Ω
V8	6AU6	82K	*55K	360Ω	360Ω	*55K	*55K	2200Ω		
V9	6AQ5A	10K	7Ω	360Ω	360Ω	●*500Ω	●*500Ω	10K		
V10	6X4	220Ω	NC	INF	INF	NC	230Ω	¶		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
● MEASURED IN "RECORD" POSITION.
† MEASURED FROM PIN 7 OF V10.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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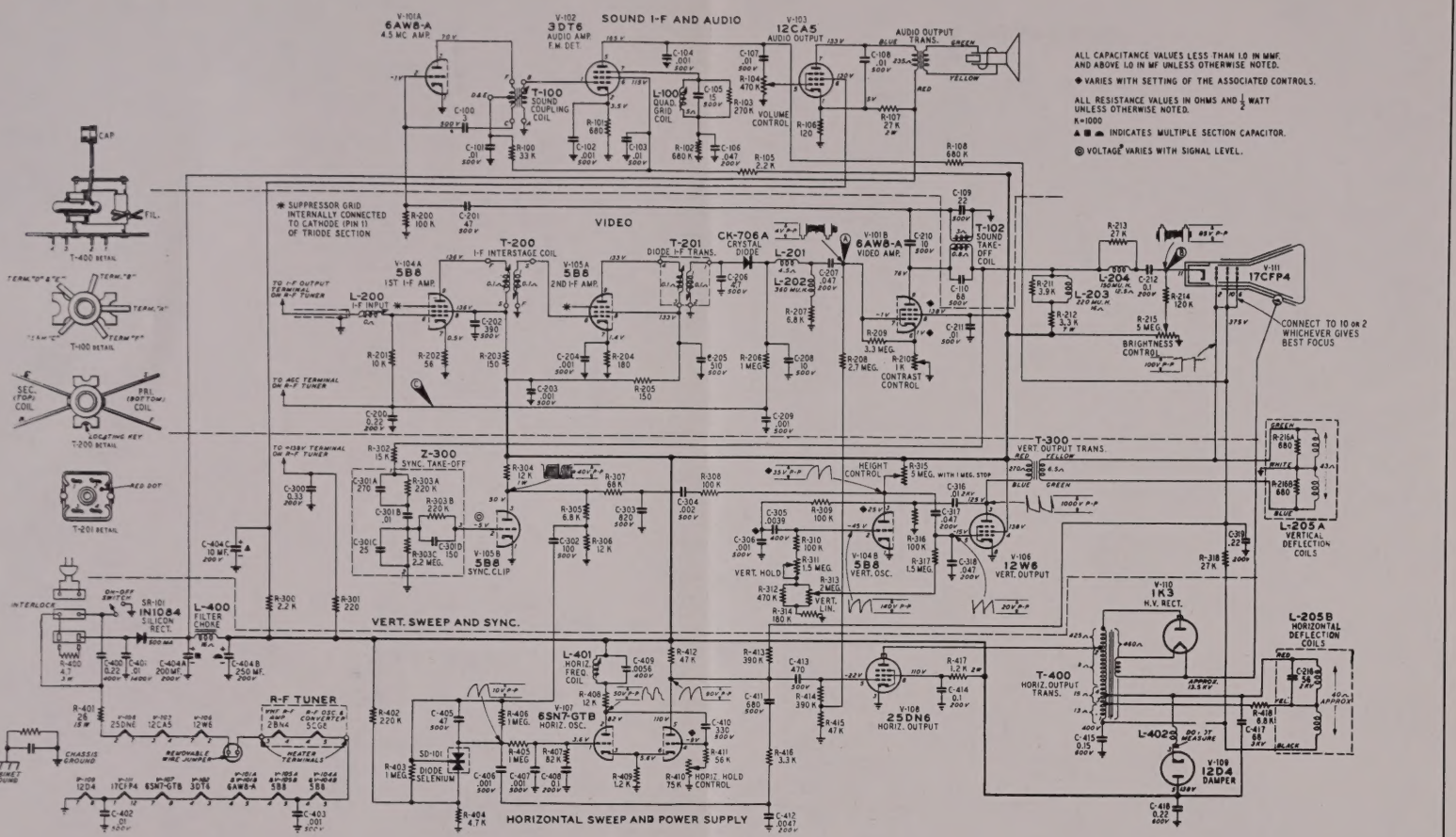
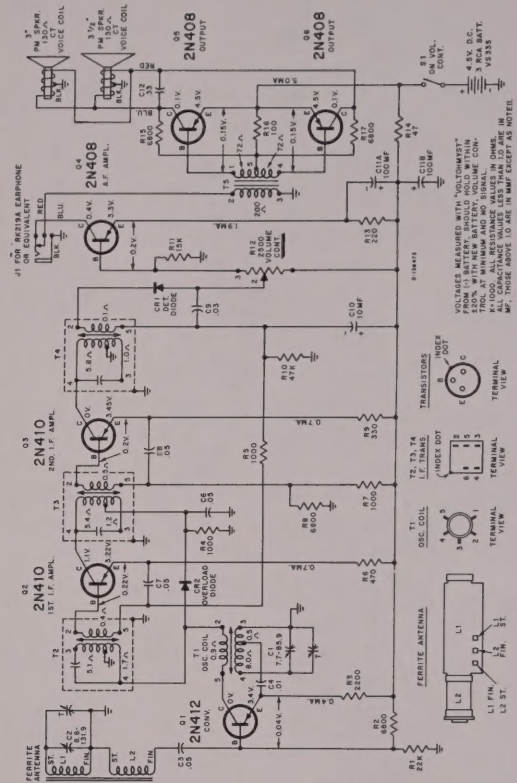
WEBSTER ELECTRIC
MODELS SS694A, SS694B



TRUETONE MODEL 2DC3030A

Schematic Diagram Courtesy of Western Auto Supply Co.


2N408 OUTPUT
2N408 A.F. AMPL.
2N410 2ND. I.F. AMPL.
2N410 1ST. I.F. AMPL.
2N412 CONV.
TRANSISTORS
FERRITE ANTENNA
VOLTAGES MEASURED WITH "VOLTOHMYST" FROM TERMINAL TO CHASSIS WITH 120V. A.C. SUPPLY. ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MMF; THOSE ABOVE 1.0 ARE IN MF EXCEPT AS NOTED.

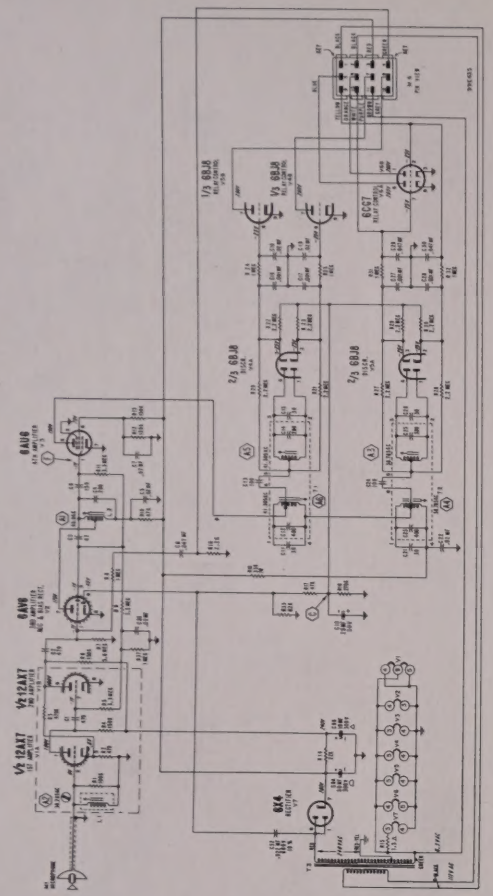
RCA VICTOR MODELS TX-1, TX-1K,

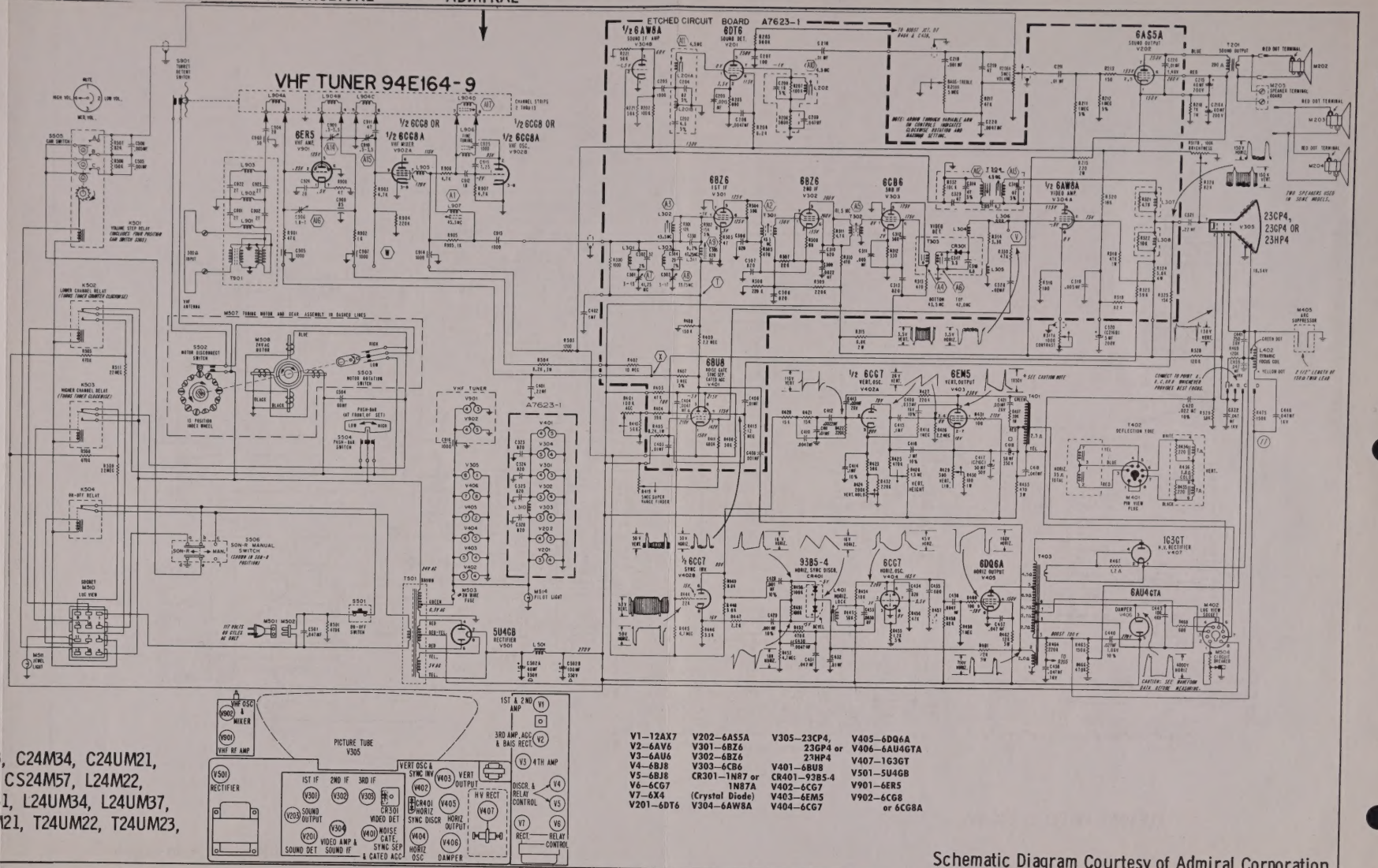
TX-1HE, TX-1JE (CH. RC-1196A)

Schematic Diagram Courtesy of Radio Corporation of America

← RCA VICTOR ← TRUETONE ADMIRAL

Schematic for 7T1 Remote Control Amplifier





ADMIRAL MODELS C24M21, C24M22, C24M23, C24M32, C24M33, C24M34, C24UM21, C24UM22, C24UM23, C24UM32, C24UM33, C24UM34, CS24M52, CS24M57, L24M22, L24M27, L24M31, L24M34, L24M37, L24UM22, L24UM27, L24UM31, L24UM34, L24UM37, LS24M52, LS24M53, LS24M54, T24M21, T24M22, T24M23, T24UM21, T24UM22, T24UM23, TS24M52, TS24M53 (Ch. 7T1, 20G6, 20M6, 20UG6)

V1—12AX7	V202—6AS5A	V305—23CP4, 23GP4 or 23HP4	V405—6DQ6A
V2—6AV6	V301—6BZ6	V401—6BU8	V406—6AU4GTA
V3—6AU6	V302—6BZ6	CR401—93B5-4	V407—1G3GT
V4—6BJ8	V303—6CB6	V402—6CG7	V501—5U4GB
V5—6BJ8	CR301—1N87 or 1N87A	V403—6EM5	V901—6ER5
V6—6CG7	(Crystal Diode)	V404—6CG7	V902—6CG8 or 6CG8A
V7—6X4	V304—6AW8A		
V201—6DT6			

Schematic Diagram Courtesy of Admiral Corporation

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